University of Alberta

Ecosystem Linkage Patterns That Promote Health in Childhood

by

Mary Anne Venner

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Nursing

Faculty of Nursing

Edmonton, Alberta

Fall 2002

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled **Ecosystem Linkage Patterns That Promote Health in Childhood** submitted by Mary Anne Venner in partial fulfillment of the requirements for the degree of Master of Nursing.

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Sept 18, 2002

Abstract

Implementation of collaborative community systems encounters many challenges. A case study described the state of linkages in a child's ecosystem. A model of ecosystem integrity (ESI) for childhood was proposed that brought together Bronfenbrenner's Ecological Systems model for childhood and an adaptation of Westra's (1998) concept of ecological integrity (EI). Linkages for children/youth in Alberta were examined using purposeful sampling. A systems method was piloted. A beginning linkage theory of ecosystem integrity (ESI) for healthy childhood was developed. Findings supported the study model. When the ecosystem for childhood, defined by Bronfenbrenner's Ecological Systems model, is examined for linkages that develop the four abilities of ecosystem health, as adapted from Westra (1998), ecosystem integrity (ESI) for childhood, as an extension of ecological integrity (EI), is described. The major conclusion is that sustainability of the ecosystem benefits from the collaborative linkage patterns that indicate ecosystem integrity (ESI) for childhood and the ecosystem itself.

Acknowledgements

My thesis is dedicated to The Community University Partnership for Study of Children, Youth and Families. May it continue to grow and strengthen our children/youth, families, and community environments.

It is dedicated to the inspiring teachers of children, who I came to know at the Child Study Centre, University of Alberta, Edmonton, Alberta.

I gratefully acknowledge my family, a pillar of support.

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CHAPTER I

INTRODUCTION

Because change is inherent to the child's life, and elements of a healthy childhood are dynamic and interrelated, achieving a healthy childhood remains a struggle for many children and an ongoing goal for society. Children comprise approximately one third of Canada's population, and one in five children live in poverty (Canadian Institute of Child Health [CICH], 1997). CICH has concluded that powerful global economic and social factors bring multiple changing relationships and an increased diversity of children to most Canadian communities. The number of children "at risk" and with special needs in Canada is between 30% and 50% of urban populations of students, and 15% to 20% of rural populations (Mawhinney, 1993). Furthermore, it is increasingly necessary to care for children with complex health and educational needs at home, in schools, and in the community. Equitable access for all children to supportive environments that facilitate healthy development in their daily lives is vital to prevent the consequences of failed potential (Hertzman & Keating, 1999; Michalski, 1999; Mustard & McCain, 1999; Weiss, Woodrum, Lopez, & Kraemer, 1993).

Recognition of the interconnectedness of the child to its family and the communities where they live, and of the implications of this, is a crucial need. Accumulating research evidence shows that children's biological systems are affected by their social and physical environments (Cynader & Frost, 1999; Gunnar & Barr, 1998; Shore, 1997; Sylva, 1997; Tremblay, 1999). For this reason there is a great deal of support for ecological, holistic, community-based approaches to meet the complexities of children and youth (Bruner, 1991; Epstein, 1995; Hertzman & Keating, 1999; Weiss et al., 1993). The need for linkages within children's communities has initiated development of community systems approaches with macro-scale planning, public engagement, linking schools and communities, and developing the knowledge base within communities (Bruner, 1996b; Shields, 1995; Weiss et al., 1993). Successful implementation of this broad initiative demands collaborative, community, interdisciplinary, and intersystem work. Challenges for the development of these linkages include perceptual and institutional barriers, lack of interdisciplinary research and

education, lack of public engagement, and a dearth of services and funding (Bruner, 1996a; Crowson & Boyd, 1996a ; Lewington & Orpwood, 1995; Mawhinney, 1993). Research has determined what is essential to enable a healthy, successful childhood, but greater understanding of how to effectively bring this knowledge into practice in communities through implementation of large-scale community linkages within community systems, is critically needed (Bruner, 1998).

There is little research evidence that described the foundation required upon which to build and sustain supportive environments for children. Integrated approaches are frequently necessary in all levels, but these have not been systematically identified or described. To address the determinants of a healthy childhood, more research is needed to achieve greater understanding of what supportive environments may look like, what their outcomes are, what constitutes effective integrated approaches, and what pathways of linkage are effective. This research may help increase the likelihood of the successful implementation of supportive environments that embody meaningful, efficient, collaborative community effort in the child's best interests.

CHAPTER II

LITERATURE REVIEW

The concept of a healthy childhood is one in which biological and environmental knowledge have become more integrated. The majority of the research evidence included in this review was from the last decade. During that period, increasing interdisciplinary perspectives and broader views regarding the societal scope of responsibility for enabling a healthy childhood for all children and youth have emerged. Earlier major works from the institutional and organizational field are referred to because they have been cited as important sources of institutional factors that may impede or enhance linkage formation. This literature review has the following parts:

1. the research outlining the responsibilities for building a healthy childhood;
2. a description of the ecological approach needed to address the complexities of childhood including the concept of ecological integrity; and
3. an explanation of emerging societal movements advocating service integration and coordination, school-community connections, parent partnership, and public engagement that can potentially contribute to a framework of linked support for children and families, including the potential facilitation of and barriers to these linkages.

Health in Childhood

There are four major determinants of healthy child development that focus on strengths: protection, relationships, opportunity and hope, and community (CICH, 1997). Bearer (1995) described health as multidimensional, a "philosophic stance," and a shared community life. To underline the urgency and responsibility for children and youth, recent neuroscientific evidence has shown that stimulation in the early years significantly affects the development of emotions, thinking, and behaviour in children (CICH, 1997; Cynader & Frost, 1999; Gunnar & Barr, 1998; Mustard & McCain, 1999; Shore, 1997; Sylva, 1997; Tremblay, 1999). Findings from neuroscience have demonstrated that environment is important for growth of the brain. When children and youth are raised in physically or socially impoverished environments or endure stressors such as prolonged

pain and attachment problems, it results in destructive processes such as loss of nerve cells, their dendrites and synapses. Dendrites may be pruned and synapses with other neurons may be shed unless they are being used. The experiential life of children shapes brain development through mechanisms such as increases in stress hormones like glucocorticoids (e.g., cortisol; Gunnar & Barr, 1998). Lack of nurturing will produce a brain that is physically different from that of a child who has been nurtured. Management of these stress hormones may improve medical and behavioural outcomes for children (Gunnar & Barr, 1998). Morison and Chisholm (1995) assessed the development of children who were adopted to Canadian homes from Romanian orphanages in the early 1990s. Study validity was increased by controlling for prenatal exposure and other background variables using a control group of other Romanian infants who would have been reared in orphanages if not adopted before four months. The sample size of 44 was small. However, it was found that the developmental delays 11 months post-adoption were positively related to the length of institutional stay. It is not yet known scientifically if these early experiences have permanently programmed the stress systems of these children or affected their brain development. Bruer (1999) has cautioned that the brain has a lifelong plasticity and that the neuroscientific effects of parenting and educating require much greater evidence.

There is widespread agreement that children's healthy development occurs through the interaction of both nature and nurture. There is debate on the characteristics of this interaction (Sylva, 1997). Considerable evidence shows that influencing the cognitive and the social-emotional domains of child development is most promising in improving long-term outcomes for children (Hertzman & Keating, 1999; Hertzman & Power, 1997; Hertzman & Wiens, 1996; Steele, 1998; Wadsworth, 1997). It is through a cumulative combination of "latent effects" from the child's specific circumstances, and "pathways of living" over time, that childhood experiences affect health over the life cycle (Hertzman & Power, 1997). These two perspectives, however, generate different policy and program intervention approaches that must be reconciled.

American research on the effects of children's environments, frequently conducted in disadvantaged communities, usually does not focus on the geographic neighbourhood for socioeconomic or psychosocial intervention when residence in these

environments is a known threat to health (Hertzman & Wiens, 1995). From their reviews of studies of intervention programs for preschool and primary grades in the United States, it is acknowledged that long-term compliance problems often create a threat to study validity.

There is an association between social organization and health not only at the individual level, but also at the national level. A British national birth cohort study of infants (Wadsworth, 1997) was begun in 1946, with follow-up to adulthood (n = 1,500 males and 1,500 females). The results show that changing social factors affect social and health knowledge in individual children. Significant associations were found between health-related habits, social class, and educational attainment. Longer term studies with a developmental perspective that integrates knowledge of environmental and biological risks are needed to clarify the effects of adversity on child health (Maughan & McCarthy, 1997). Health, therefore, is not simply the absence or prevention of illness.

The Ecological Approach to Defining Healthy Childhood

An ecological approach is concerned with the child as a developing organism in relation to its environment (Heinzer, 1998; Simeonson et al., 1996). Bronfenbrenner's (1979) theory of the ecology of child development (see Figure 1) describes *environment* in terms of an ecosystems model. The micro-systems are the child's immediate settings such as the family or classroom. The meso-system is the relations among the micro-systems such as family, school, and professional oollaboration. The exo-system is the relations among settings such as organizational structure and policies, in which the child does not participate, but that influence these settings. The macro-system includes the large patterns of social organization such as cultural values. Therefore, ecological approaches to children's care using Bronfenbrenner's ecological systems model consider micro-, meso-, exo-, and macro-systems of social structures and physical settings in planning goals and outcomes. Bronfenbrenner emphasized the importance of specifying the interaction between the biological, social, and other environmental forces that are factors in both immediate and distant physical and social environments. He stated that the ecology of human development "lies at a point of convergence among the disciplines of the biological, psychological and social sciences as they bear on the evolution of the individual in society" (p. 12).

Bronfenbrenner (1979) defined the ecology of human development as the "scientific study of the progressive, mutual accommodation, throughout the life span between a growing human organism and the changing immediate environment in which it lives" (p. 21). Although recognizing the presence of mutual accommodation and effects of multiple human and non-human systems, Bronfenbrenner, did not detail how these elements, together, influence childhood. An ecological approach, therefore, can acknowledge the interrelationships and implications of complex systems that affect the lives of children and families.

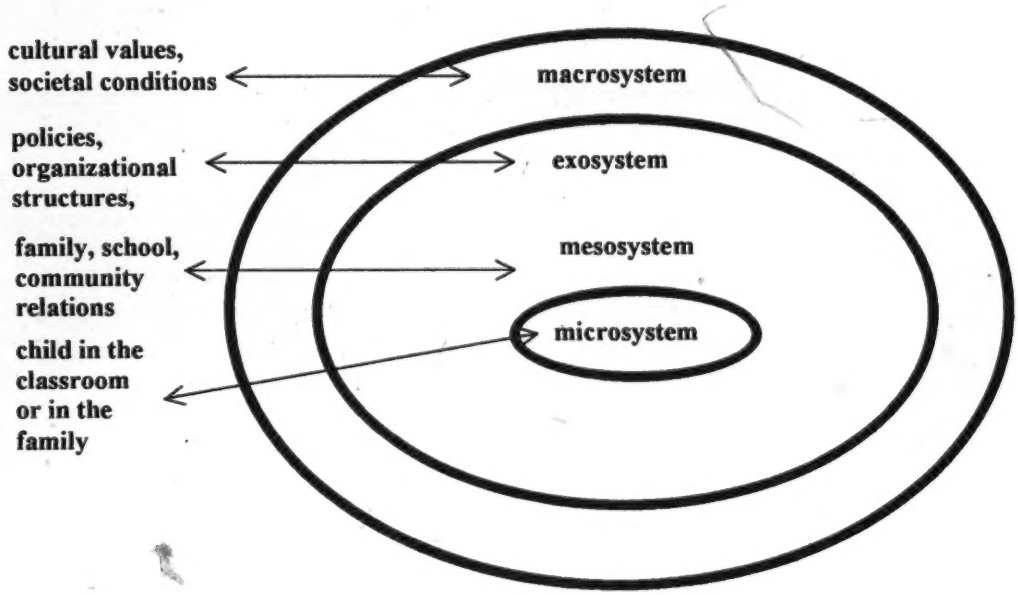


Figure 1. Bronfenbrenner's (1979) ecological systems model.

Childhood is increasingly seen as a unique developmental stage of life (World Health Organization [WHO], 1999). Recent literature on healthy childhood highlights the importance of the expansion of disciplinary frameworks concerning childhood, the use of multi-interdisciplinary approaches, and the incorporation of parent and family perspectives across the disciplines such as education, health, and the social sciences (Carrieri-Kohlman, Lindsey, & West, 1993; Ciccheti, Toth, & Lynch, 1995; Epstein, 1995; Forrest, Simpson, & Clancy, 1997; Hertzman & Keating, 1999; Kagan et al., 1995; Wang, Haertel, & Walberg, 1997). Research evidence reiterates the effectiveness of

ecological, family-focused, community-based approaches for developing child and family resilience (Bronfenbrenner, 1979; Bruner, 1991; Drummond, 1998; Goldberg, 1997; Kysela, McDonald, Drummond, & Alexander, 1996; Mawhinney, 1993; Mustard & McCain, 1999; Sanders & Epstein, 1998; Weiss et al., 1993).

In Canada and the United States there have been initiatives directed at achieving this broad-based ecological approach, to develop more integrated systems, to emphasize early intervention, to reduce fragmentation, to reduce long-term economic and social costs, and to provide for more holistic practice to meet the changing realities of children and families (Brazelton, O'Brian, & Brandi, 1997; Cibulka & Kritek, 1996; Cormany, 1993; Crowson & Boyd, 1996b; Hertzman & Keating, 1999, Kahn & Kamerman, 1992; Kyle & Kellerman, 1998; MacDonald, 1994; Mawhinney, 1993; Wyly, Allen, Pfalzer, & Wilson, 1996). The Canadian framework *Achieving Health for All* (Epp, 1986) and the Ottawa Charter for Health Promotion (1986) are earlier examples of the broadening of the health promotion framework in Canada. Present examples of individual projects using more integrated approaches to early childhood practices in Canada are the "123 Go" project in Montreal and "Better Beginnings" in Ontario.

Implementation of more integrated community systems, on a macro scale, is advocated in Canada and the U.S. (Bruner, 1996c; Epstein, Coates, Salinas, Sanders, & Simon, 1997; Kyle & Kellerman, 1998; MacDonald, 1994; Mawhinney, 1996; Zetlin, 1998). The disintegration of the PEW Charitable Trusts Children's Initiative (Cohen, 1994), begun in five American states in 1992 for $60 million, illustrated the difficulties of accomplishing large-scale changes in practice and the importance of an increased knowledge base in the community of this area of community development. The broad vision for addressing children's needs has moved from one of service integration to community collaboration and "community systems" (Bruner, 1996a; Mawhinney, 1996; Shields, 1995). Implementation of the necessary research practices tracking such innovations has been poor and lacking investment (Bruner, 1996c; Crowson & Boyd, 1996a; Mawhinney, 1993).

Systems theory has rarely been used as an analytical tool (Green, Richard, & Potvin, 1996). The Adaptation of the Precede-Proceed Model for Ecologically Sustainable Community Planning and Evaluation (Green et al., 1996) is an ecosystems

approach that recognizes societal complexity. It identifies and utilizes broad phases of societal supports within communities. Similarly, the Adaptive Methodology on Ecosystem Sustainability and Health (AMESH), as described by Murray et al. (1999), is an approach to analysis that was built on the use of complex ecosystems. AMESH was created as a research process in a selected case study involving a community area and its land use in the Amazon wetlands that encouraged the outcomes of health and sustainability in the community that was being studied.

Ecological Integrity

The concept of *ecological integrity* (EI) has moved to the World Health Organization (WHO) agenda (Soskolne & Bertollini, 1999). EI is defined as "wholeness or integration of ecosystem structure and function" (p. 1). To date it has focused on the ecological integrity of the physical environment. Westra (1998) defined the concept through four abilities:

1. the ability to sustain ecosystem health and its well-being;
2. the ability to deal with outside interference and if necessary regenerate itself; . . . capacity to withstand stress;
3. the ability to preserve the system's optimum capacity for greatest possible ongoing development, . . . biodiversity;
4. the ability to continue its ongoing change and development unconstrained by human interruptions. (p. 8)

The concept of EI recognizes the "commonality among all that exists" (p. 24), but only at the level of survival.

It is possible to consider the concept of EI from the societal context, because humans are embedded parts of ecosystems. Societies as communities within ecosystems may consciously act to contribute either positively or negatively to this state of being. In human terms, for example, the four abilities could be reframed to represent the following critical abilities in healthy childhood: their ability to maintain health and contribute to the sustainability of the ecological system, their ability to withstand stress and to regenerate, their ability to develop optimally and self-actualize, and their ability to adapt to severe adversity caused by human or non-human elements (resilience).

It has been said that the focus for the sustainability needed for EI of the physical environment should be on society, not on development (Karr, 1993; as cited in Soskolne

& Bertollini, 1999). Similarly, for EI for childhood to be valued in people's own communities, it is crucial that the discussion be deepened. An important endeavour for societies, then, is to explore the structures and processes enabling the healthy abilities in the process of being that defines EI, in both children and societal systems.

Westra (1998) stated, "Integrity can be observed; . . . it represents a phenomenological reality," and the concept of EI should be "scientifically definable" (p. 10). Soskolne and Bertollini (1999) proposed that a main role for WHO should entail "scenario-based risk assessment," which can differ from a more traditional approach using empirical data. They stated that tools and indicators should be formed to evaluate changes in life-support systems and measure the impacts of ecological decline in physical structures. To accomplish this goal, exploring and valuing complexity through research methods with more interactive dialogue and democratic inclusion of perspectives are essential (Murray, Lay, Waltner-Toews, & Raez-Luna, 1999; Ravetz & Funtowicz, 1995; Schrader-Frechette, 1995; Westra, 1998).

Linkages: Indicators of Interrelationships in the Ecosystems of Children

A *linkage* is defined as "anything serving to connect or tie" (*Webster's*, 1962, p. 853). School-linked services are defined as "a system of inter-related resources that links schools, families, and public and private service agencies" (Wang et al., 1997, p. 2). The following section discusses the literature using the broad fields necessary for linkages for childhood: service system integration and coordination, school-community connections, parent and public participation, and barriers and facilitators of linkages within the organization of systems.

Service System Integration and Coordination

Service integration and coalitions are essential components of community linkages, but service integration alone will not build the essential broad-based support (Bruner, 1996a; Shields, 1995; Weiss et al., 1993). Only the inclusion of community collaboration and support for such collaboratives will promote the successful implementation of service integration initiatives. Further, the use of principles based on an expanded concept of child health as a paradigmatic foundation can result in delivery systems in which theory and practice are much more integrated (Bonner & Finney, 1996;

Briggs, 1997; Steele, 1998; Weston et al., 1997). In a four-tier model of service coordination (Cormany, 1993) for young children with special needs, a basic principle is that child and family needs, priorities, and strengths be recognized at the beginning of service planning. A shared language to work toward this nurturing environment then becomes a need for parents and professionals.

Children in Canada and the United States remain vulnerable in services to young children (Bruner, 1996b; Kyle & Kellerman, 1998; Mustard & McCain, 1999). Community institutions have not yet determined their responsibilities during the early childhood years, and the early childhood field is often left with a daycare label only (Kagan et al., 1995). For the early years the dual challenge is the integration of care and education within the early childhood domain and the expansion of integrative responsibility across domains. Programs using flexible, family-centred approaches to meet diverse elements in child and family needs and promote primary prevention and wellness for children are increasing in Canada (Kyle & Kellerman, 1998). In a series of 15 case studies of Canadian family resource programs, considerable fragmentation of childcare supports and a lack of common language to describe these programs and their goals are reported (Kyle & Kellerman, 1998). Sample cases from a diverse cross section of family resource programs across the country were used for this descriptive ethnography.

It has been suggested that it is a service gap and not fragmentation that exists in linkages for comprehensive approaches in early childhood (Bruner, 1993a; 1996). This area should be a top priority because of the importance of achieving early educational goals (Bruner, 1993a; Mustard & McCain, 1999). Mustard and McCain advocated meeting society's responsibilities for these critical years with a commitment to embedding in communities throughout Canada "early childhood development and parent support sites" (p. 156) to provide daily care to this age group, along with comprehensive support to families.

Cultural context is an important factor in determining how linkage processes can be most effective. A study by Hayes, Hollander, Tan, and Cloutier (1997), conducted for the Canadian Association for Community Care, asserted that the American literature often focused on specific programs of care and their funding because of the market-

oriented model in the U.S. Canada has more of a systems approach, which also affects policy and service funding strategies. This emphasizes that more research is needed in the Canadian context.

Accountability for public system programs is often based on an outcome- rather than a process-driven system. In fact, two primary fields of research are needed (Bruner, 1993b; Kahn & Kamerman, 1992; Wang et al., 1997). The first is in the area of service integration processes; for example, organizational and inter-organizational processes, political efficiencies, and costs. The second area is the child, family, and community outcomes of such processes. The service integration movement, working in partnership with other movements, is of considerable importance (Kagan et al., 1995). That is, service integration goals should address both systems and people.

School-Community Linkage

The school-community linkage is historically important, and educational institutions have considered children's healthy development as an objective (Weber, 1964). Early capitalism transformed public life Grandstaff (1982; as cited in Cafagna et al., 1982) and produced for societies what was characterized by Aries (1962; cited in Cafagna et al.) as "the invention of childhood" (p. 62). The school's role was to undertake the transformation to public life and "the reproduction of the social order" (p. 62). The school as a public institution started to share with parents the responsibility for the development of the child—a tumultuous journey. The importance of families, schools, and communities working together as the primary institutions for socializing young people has long been recognized (Capper, 1994; Epstein, 1995; Litwak & Meyer, 1974; Moles, 1997). However, putting values such as equity of roles, consultation, and mutually defined goals into practice to reach the level of the child and family has been difficult (Boyd, 1998; Cibulka & Kritek, 1996; Crowson & Boyd, 1996a, 1996b; Epstein, 1995; Lewington & Orpwood, 1995; Mawhinney, 1996; Rigsby, Reynolds, & Wang, 1995; Tizard & Tizard, 1979). If schools would be transformed into interactive learning communities, they would equip children with the social practices to actively participate in the construction of knowledge, a skill required for the learning societies of the next century (Rohlen, 1999; Scardamalia & Bereiter, 1999).

An examination of the organization of healthcare work and children's views of the status of their health at school was carried out in England and Wales (Mayall et al., 1996). The school was viewed as a health care system, and the perspectives of staff, children, and parents were explored. A questionnaire was used to survey a stratified representative sample (n = 620) of all primary schools in England and Wales. The second part of the study examined six case studies, each from a different geographic area, through interviews with staff, children, and parents. The results indicated that the children felt a sense of being controlled through structures they felt powerless to alter. Mothers perceived their children's health in the school environment as very important but mothers and teachers had their own distinctive perspectives regarding children's health. Goals of partnership remained a struggle because of the perceived "expert roles" of teachers and the "experiential" knowledge of parents. Children had no role in determining critical areas of their school lives. The absence of coordination between education and health services was a pervasive problem. It was concluded that a national priority for upgrading education and health requires that they be linked concepts.

There has been growth of school-linked service initiatives in the United States and in Canada: Harvard Family Research Project (Weiss et al., 1993), the Better Beginnings project of the Government of Ontario (Mawhinney, 1993), and the Student Health Initiative Partnership in Alberta (Alberta, 1999). The three common models of service coordination are school based, in the building; school linked, with the school as an integral partner; or community based, with the schools playing a minor role. It appears that the school-linked model was generally most effective (Crowson & Boyd, 1993). Children's services collaboration in schools, however, often remained at the stage of simply co-location rather than a shared sense of mission, control, and communicative linkages to support children in the institutional environment (Boyd, 1998; Capper, 1994).

Cross-site analysis of six school-linked inter-sectoral programs found that the method of choice for service delivery was case management involving interdisciplinary teams and with a preventive focus (Wang et al., 1998). Two thirds of respondents stressed the importance of ownership facilitated by a lengthy planning period. Five of six sites identified the resolution of client confidentiality issues as critical. Location of services varied from school based to school linked, and technical assistance was

considered critical to collaborative effort. An area identified for more research was the interaction between two school reform movements that facilitate more inclusion: site-based management, including school advisory councils, which include public participation; and collaborative school-linked services.

The knowledge base on school-linked services is growing, but the research results are limited (Wang et al., 1997). Few rigorous systemic studies have been conducted. A review of six school-linked service programs and a meta-analysis using a quantitative synthesis of 44 studies of the effects of school-linked programs on children's cognition, affect, and behaviour found four categories and supporting indicators to successful implementation (Wang et al., 1997). These practice clusters include planning for implementation, a client-focused approach, conditions that promote inter-professional collaboration, and resource allocation. Process and outcome measures used to document implementation and effectiveness of school-linked service programs were not tied tightly enough to the phenomenon to be measured. It was concluded that broader social policies are required to achieve the broader outcomes of learning success for children and youth.

There are four interconnected movements that influence the area of school-community relations: parental involvement in school governance, instructional partnerships for learning, school to community outreach, and children's service coordination (Crowson & Boyd, 1993). All are vital areas of linkages among disciplines and areas of care for healthy development of children, youth, and families (Bruner, 1996b; Epstein, 1995; Weiss et al., 1993). Increasing diversity in school populations, from children's innate characteristics and from the heterogeneousness of cultural contexts, has brought greater challenges. A broader conceptual framework for the school community's role in supporting healthy development, other than health curriculum delivery, is emerging (Cibulka & Kritek, 1996; Government of Alberta, Student Health Initiative Partnership, 1999; Heibert, Dollins, & Cairns, 1994; Herrington, 1994; Marx & Wooley, 1998; Rigsby et al., 1995; Wang, Haertel, & Walberg, 1998; Wisconsin State Department of Health and Social Services, 1997). The primary goal was healthy, resilient, successful learners (Wisconsin State, 1997). There is increasing support for schools, as public institutions, to recognize a shared responsibility with other community

areas to pursue strategies for influencing the interconnections between learning, healthy childhood, and healthy communities.

Parent and Public Participation Linkages

Parent and public participation linkages in institutional process and in the planning of integrated care for children is important to mutually benefit the child, family, and community. Successful implementation of this goal, however, has often been limited (Cibulka & Kritek, 1996; Epstein, 1995; Lewington & Orpwood, 1995; Weiss, 1995). Softening the institutional boundaries of schools to encourage school-community involvement and public dialogue was seen as crucial by Canadian authors Lewington and Orpwood (1993) and others (Boyd, 1998; Herrington, 1994; Moles, 1997). School councils composed of parents, teachers, community members, and the principal were legislated in Alberta in 1995 and are advisory in nature. Though fraught with challenges, community involvement and democratic public engagement in schools were seen as critical to enhance children's learning, an important part of healthy development, and to build societal supports benefiting families, schools, and the larger society (Comer; as cited in Goldberg, 1997; Danzburger & Friedman, 1997; Driscoll, 1995; Epstein, 1995; Mawhinney, 1993; McKenna & Willms, 1998).

Epstein (1997) stated that "overlapping spheres of influence" (p. 72) in the child from the school, the family, and the community create a need for partnership among these areas. These relationships may become a form of social capital, community assets reflecting shared norms and values. Because of broad societal factors such as growing parental involvement in the workforce, the work areas of parents become a factor in enabling contributions to schools. Kagan et al. (1995) suggested involving parents as experts and consultants for planning, implementing, and evaluating service integration efforts. Public dialogue and knowledge development, including its democratic dissemination, were considered vital to build the strong foundation of support that is needed for large-scale implementation of integrated approaches to community care (Biggs, 1996; Kahn & Kamerman, 1992; Peters, 1996).

Barriers and Facilitators of Linkages

Barriers and facilitators to linkage are many. The effects of institutional characteristics on coordinated linking and planning for broad transformative change for children across communities are significant. Institutions were recognized as wielding both positive and negative influences (Meyer & Rowan, 1983; Perrow, 1986, cited in Adler, 1993; Powell & DiMaggio, 1991; Zucker, 1987). The complexities of integration and coordination demand a focus on the core structures in the institutional context to facilitate real progress toward broad community support, program implementation, and knowledge dissemination (Adler & Gardner, 1993; Crowson & Boyd, 1996a; Epstein, 1997; Mawhinney, 1996). An analysis of six case studies among agencies providing early childhood intervention in six states shows fundamental differences between agencies and their missions (Harbin, 1996). The results indicate that languages among agencies differ and keep organizational boundaries less permeable to others. Successful efforts at integration result in processes for joint planning and policy development guided by common goals.

Significant barriers to effective linkage practices and integrated approaches were identified such as perceptual differences, institutional influences, inequality of knowledge, lack of agreement in the area of outcome evaluation, competition for funds, and conflicting policy. Differences in perception in the areas of roles and responsibilities as well as discipline-specific influences and the undervaluing of other roles appeared well documented as major persistent factors (Austin & McClelland, 1996; Bruner, 1991; Crowson & Boyd, 1993; Driscoll, 1995; Harbin, 1996, Heibert, Dollins, & Cairns, 1994; Mawhinney, 1997; Tipper & Avard, 1999). Research on children's own views of health is limited (Broadwell Jackson & Saunders, 1993). Children usually perceive health as a multidimensional construct (Hester, 1987). School-age children described it as the ability for physical activity, personal grooming, physical health, nutrition, emotional health, and sleep. Frequently, studies that interview or question children themselves have focused on skill sets or concerns rather than on a strengths-based perspective of inquiry (Graham & Uphold, 1992; Maylath, 1990; Weiler et al., 1993). Expressing the influences of ethnicity has also proved difficult (Graham & Uphold, 1992).

Childhood illness has been shown to be a factor in the perception of supports needed for healthy child development. A study of three-year-olds (Culley et al., 1989) who had been born prematurely found that the mothers of these children reported a significantly greater sense of vulnerability about their children than did mothers of term infants, supporting the hypothesis that health problems in infancy may have long-term effects on parental perceptions of a child's wellness. There was an association of a sense of vulnerability, behaviour problems, and somatic symptoms in the child. Measurement of both perceptions of the child's vulnerability and the maternal affective sense of well-being was a strength of this study. Sample size was small at 40 per group.

Primary to tertiary linkages are crucial to excellence of care because many children's health challenges are carried with them into schools and other community environments. Case management methods were seen as facilitators of service coordination at the level of the child (Rapp & Kisthardt, 1996). Differences between the meaning of case management and coordination of systems can be substantial, though the terms are sometimes considered synonymous (McClelland, Austin, & Schneck, 1996; Poertner, 1996). To coordinate delivery systems, restricting system coordination to sharing client information or simply resource brokering does little to integrate system planning or effort (McClelland et al., 1996). Therefore, it has become important for those planning services to determine their value base (Poertner, 1996; Zlotnik, 1996). There are increasing American initiatives bringing family-focused services across the continuum of care, using public and private agencies to develop comprehensive service systems (Zlotnik, 1996). Evaluation and standards development are in early stages. Positive outcomes of system coordination include decreased fragmentation and cost, prevention of complications, increased use of informal networks, and client confidence (Smith & Smith, 1996).

Collaborative processes are vital to linkage processes. The use of collaboration is complex and often raises the uneasy issues of communication, control, and power (Crowson & Boyd, 1993; Mawhinney& Smrekar, 1996; Rigsby et al., 1995). Policies that encourage collaboration as a fundamental part of large-scale service systems are not yet the norm (Capper, 1994; Crowson & Boyd, 1993; Weiss, 1992). Little theory exists to describe these inter-organizational relationships (Crowson & Boyd, 1996a). Currently in

Alberta, the provincial government's inter-sectoral Alberta Children's Initiative (1999), the provincial Student Health Initiative Partnership (Alberta, 1999), the Children's Mental Health Initiative (Alberta, 1999) and the formation of regional Children Services Authorities (Alberta, 1998) are examples of a larger scale, more integrated government and community effort.

Evaluating integrated practices in school-linked services, an important component of facilitating them, has proven difficult because process and outcome are very interdependent (Wang et al., 1997). The Harvard Family Research Project (Horsch, 1998) has begun one larger scale attempt with nine projects in different states. The linking of social service and health processes to educational process outcomes is considered very important. Canadian projects such as "Better Beginnings" and "123 Go" are in early evaluation stages (Hertzman & Keating, 1999).

Inter-professional education, collaborative research, and partnership formation between universities and communities were considered key pieces in the development of broad-based integrated approaches for children (Lawson & Hooper-Briar, 1993; Nucci & Smylie, 1991; Smyth & Shacklock, 1998). Collaborative learning organizations and learning communities have an increasingly recognized role in implementing complex processes into effective action to support and sustain community goals (Centre for Public Management, 1994; Ceppetelli, 1995; Keating, 1999; Senge, 1990, 1999; Zuckerman, Kaluzny, & Ricketts, 1995).

Public dialogue for articulation of values and the purposeful linking of social and economic union are essential processes to overcome many barriers to linkage on micro and macro-levels (Biggs, 1996; Peters, 1996). Accessibility of knowledge to all community areas and the working together of interest areas to prevent turf competition appears crucial.

Summary

This discussion of the literature has included the fields of healthy childhood, ecological approaches to care, ecological integrity, and the linkage areas of service system integration, school-community connections, and parent and public participation. Facilitators and barriers to linkages were discussed. There is growing knowledge of the ingredients for a healthy childhood, and efforts to realize these ingredients in

communities are under way, but access and equity are markedly variable. There is evidence of the need for building integrated perspectives and approaches to practice, in individual interactions, within institutions, and across government sectors, that care for children. Implementation of integrated systems of support remains a considerable challenge.

There is increasing recognition by disciplines, systems, institutions, and regional and global communities that a collective responsibility and accountability for healthy childhood exists. Research that provides evidence of associations between social influences and biological implications for the health of children has reached the policy level. Its relevancy to practice has been noted. Little evidence exists comparing perceptions of the childhood needs for linkage among policy sectors, health professionals, teachers, caregivers, and children about healthy childhood despite the evidence of the importance of interdisciplinary work and parent partnership. Canadian research in this area appears scarce. Research is needed to understand the linkage processes that build supportive environments for children, families, and communities.

Significance

There is growing recognition by many disciplines, systems, institutions, and communities that there is a collective responsibility and accountability for child health. Highly collaborative interdisciplinary systems, based on broad models of primary care, prevention, and wellness, will characterize the 21st century (Garland, Gallagher, & Huntington, 1997; Hanson, 1996). These systems will carry responsibility for creating supportive environments around children and will play a role in determining children's health and developmental needs. Interactive learning communities are increasingly described as a vital source of broad-based support in this process.

The significance of this study is to contribute to the knowledge about the linkage of supports of varying kinds, to bring expertise together, to expand frameworks, and to discover similarities and appreciate differences for integrated effort that support human ecosystems, enabling healthy childhood. Knowledge is needed about the interrelationships that create wholeness between ecosystem structures that influence children and the healthy functioning of children. Knowledge of this kind can contribute to strategies that strengthen children, families, institutions, and communities. Knowledge of

linkages will highlight excellence of practice and knowledge of outcomes at the child, family, and community levels.

Research Purpose

Ecological systems may structure themselves to bring "nature's services" to each other and encourage the unfolding of life (Westra, 1998, p. 31). Such services are described as "life-support systems" (Soskolne & Bertollini, 1999, p. 1). At present the concept and philosophy of Ecological Integrity (Westra, 1998) has been developed using natural environmental systems, as applicable to all life forms to the level of survival. The concept now has legal implications (Westra, 2000). Therefore in this study, the term *ecosystem integrity* (ESI) will be used to indicate a state of wholeness within human and non-human elements in the child's ecosystem that promotes the ongoing health-defining four abilities adapted from Westra (1998) for childhood. In this approach human societies are considered natural. They have a role as a part of nature's services brought to the nurturing of children for their healthy development. Societies should be capable of promoting these health-defining abilities in children that indicate ecosystem integrity. Therefore, it is contended that an ecosystem described using Bronfenbrenner's ecological systems model should possess the four health-defining abilities, adapted from Westra 's (1998) definition of ecological integrity (EI), in order to exhibit ecosystem integrity (ESI) and provide it for children.

The presence of ecosystem linkage structures for childhood in society that create environments that facilitate the observed reality of healthy abilities in children as adapted from EI may be sources of indicators of the presence of these defining abilities in children. They may also be indicators of a societal state of ecosystem integrity that contributes to these abilities in its parts. To further operationalize the concept of ecological integrity and contribute to accountability, indicators that go beyond a definition of integrity are needed (Noss, 1995). Therefore, this study has been designed to contribute to the discussion of indicators of ecosystem integrity for children and communities as human living systems.

The purpose of this study is to explore the perspectives of the participants and systems engaged in providing nurturance to children, about the linkage of supports

(structures and outcomes) in the child's ecosystem that are needed to promote healthy childhood.

Research Questions

The primary research question is: What is the nature of linkage patterns that encourage interrelationships in the child's ecosystem that facilitate healthy childhood? The subquestions are:

1. What are the linkage goals in the areas of structure, process, and outcomes from each perspective considered?
2. What are structural, attitudinal, or process facilitators and barriers to linkages that encourage healthy childhood?
3. What are the outcomes for the child, family, and community as a result of successful or unsuccessful linkages?
4. What are the indicators of successful linkage?

CHAPTER III

METHOD

Research Design

To study a case in the area of children's healthy development is to study a framework of systems that are interconnected in the child's life. In the study of systems, preserving complexity and multiple realities is critical (Westra, 1998). This preservation is a purpose of case study research (Stake, 1995). The case study is a comprehensive, empirical research strategy most useful when investigating "a contemporary phenomenon within its real-life context when the boundaries between phenomenon and context are not clearly evident " (Yin, 1994, p. 13). Case studies are important tools that help explain the links in the interventions used in reality that are too complex for other designs. It is necessary to consider contextual elements of linkage patterns, multiple sources of evidence, and theoretical guides to data collection and analysis due to complexity in this study. Both theoretical propositions as guides and case descriptive frameworks are general strategies for case study design (Yin, 1994). Both were used in this case study. A significant challenge to the study design was that systems theory has rarely been used as an analytical tool that contributes to an understanding of the promotion of broadly defined health (Green et al., 1996).

The study brought two theoretical models together. The blended models contend that when the ecosystem for children, defined by Bronfenbrenner's (1979) Ecological Systems model, uses linkages to develop the four abilities in ecosystem elements, as adapted from Westra (1998), ecosystem integrity for childhood, as an extension of ecological integrity, would result. This perspective potentiates both theoretical and naturalistic generalization of the study to contribute to "research to practice" possibilities. To bring clarity to the representation of the ecosystem of the child and to address the challenge of analysis of linkage patterns in the complex systems involved in the child's ecosystem, a unique design implementing a mix of three systems methods was carried out in the study. They are the following:

1. The Ecological Systems Model for the Ecology of Human Development (Bronfenbrenner, 1979) in childhood became the theoretical guide and descriptive organizer of the case.

2. Adaptation of the Precede-Proceed Model for Ecologically Sustainable Community Planning and Evaluation (Green et. al. 1996) became the descriptive framework within which the study database was organized.

3. The Adaptive Methodology for Research on Ecosystem Sustainability and Health (AMESH; Murray et al., 1999), a research process framework for complex systems, was used to guide the case study analysis.

Bringing together two theoretical models and using three research frameworks enabled the navigation of complexity across the four levels of the ecosystem. It enabled the ability to purposely reach the child's micro-system with due consideration of linkages in the other ecosystem levels that affected the child and family. It enabled the perspective of pertinence to both research and practice.

The advantages of using systems theory as an analytical tool include recognition of dynamic qualities, exchanges and communications, hierarchy, and interdependency that encompass whole ecosystems (Green, 1996). The use of three systems tools in this study aimed for these goals within the research of the child's ecosystem. The Ecological Systems Model (Bronfenbrenner, 1979) for childhood as the theoretical guide and organizer of the case organizes micro, meso, exo, and macro-levels to the child's ecosystem with the inclusion of community elements. According to Bronfenbrenner (1979), the *micro* system is "a pattern of activities, roles, and interpersonal relations experienced in a given setting with particular physical and material characteristics" (p. 22). The *meso* system is defined as "interrelations among two or more settings where the child actively participates" (p. 25). The *exo* system is defined as "one or more settings that do not involve the developing person as an active participant but in which events occur that affect or are affected by what happens in the setting containing the developing person" (p. 25). The *macro* system is defined as "consistencies in the form and content of lower order systems that can exist at any level of the culture as a whole" (p. 26).

The Adaptation of the Precede-Proceed Model for Ecologically Sustainable Community Planning and Evaluation (Green et al., 1996), the descriptive framework to

guide data collection, assisted purposeful sampling for the case. Its phases were used as a descriptive framework to guide data collection of community linkage structures, processes, outcomes, barriers, and facilitators. Its phases include the administrative and policy vision, the educational and organizational vision, the quality of life vision, the global and community vision, implementation, process evaluation, and outcome evaluation. The descriptive framework enabled these phases to become the embedded subunits within the case study (Cresswell, 1998). Detailed participant perspectives and inter-sectoral policy and organizational plans were accessed. This tool recognizes ecological approaches to health as systems within an ecosystem that interact with other systems to build outcomes (Green et al., 1996).

A complex socioecological system cannot be understood using a single model Murray et al. (1999). Ecosystem complexity is recognized through consideration of scale, problem context, diverse perspective, synthesis, and hierarchies (Murray et al., 1999). Understanding comes from a layered process of data analysis that included multiple perspectives and sources of evidence. The Adaptive Methodology on Ecosystem Sustainability and Health (AMESH; Murray et al., 1999) was selected as the systems tool to guide the ecosystem analysis. The perspectives of the child, parent, multiple disciplines, management at the organizational, and community levels were explored and analyzed according to the research question and sub-questions.

There are no standard formats for reporting case study research. It is the "intent of the case study to shape the larger structure of the written format" (Creswell, 1998, p. 186). The rhetorical structure should include an extensive description of the case and its context, "a description the reader might make if they had been there" (p. 186). The amount of description versus analysis is up to the writer, but recommendations include a 60%/40% split, or a 70%/30% split in favour of description (Creswell, 1998). The primary descriptive analysis of the case is undertaken in Appendix C and in the ecosystem charts and document templates that are available from the researcher.

Selection of the Case

In order to maximize learning (Stake, 1995) purposeful case selection and sampling of data sources were used. Different contexts and an interdisciplinary perspective were addressed. It is policy that children with challenges of many kinds be

included in school environments in Alberta. A child with health challenges but who functioned well within a school community was selected from the ambulatory care setting within the regional child health institution. The choice of this case facilitated access to detailed description of the working complexity within the community systems. In this way a number of different sectors, institutions, disciplines, and environments could be sampled giving opportunity for consensus of opinion to emerge and for power and rigor to be standardized. It also facilitates appropriate sampling at a sufficient level of bureaucratic responsibility to increase validity and reliability. This latter was triangulated by the document review. It was presumed that the concerns for such a child and family would be similar to, and more acute than, healthy children attending schools.

The case selected centred on a 10-year-old child (M). Two institutional environments supported M: her neighbourhood public school in the regional public school system and the regional child health centre. M had Omenn's syndrome, which is a severe combined immunodeficiency characterized by hyper-eosinophilia and elevated serum IgE concentration. Severe combined immunodeficiency (SCID) is a primary immune deficiency with severe defects in both the T- and B-lymphocyte systems. This usually results in the onset of one or more serious or life-threatening infections such as pneumonia, meningitis, or bloodstream infections within the first few months of life. M's disease was diagnosed at age four months, and she received a bone marrow transplant at age 10 months. Because of the number of participants involved in the case that were needed to reflect the complexity of the case, only one parent, M's mother, was selected to bring the perspective of the family, for data gathering through conversation.

The Ecological Systems Model (Bronfenbrenner, 1979; see Figure 1) served as the overall organizer for the case. The micro-system was identified as the child in a given setting such as the classroom or the family; the meso-system was identified as the relationships among immediate family, school, and community; the exo-system was identified as the organizational structures and policies that affected the child's system but in which the child was not involved; and the macro-system referred to the societal consistencies that existed throughout the child's systems. The case subsystem data sources included the following:

1. a school-age child (M), 10 years of age, from an ambulatory care setting, who had an ongoing health condition that was currently requiring sustained support, but who was able to attend her neighbourhood school;

2. her mother as a primary caregiver with extensive knowledge of M's care;

3. the members of two disciplines that provided ongoing care to M: her two classroom teachers (teachers A and B), and her two physicians, one giving her subspecialty care (physician A), and the other, a specialist who had the primary (first point of access) physician role (physician B);

4. M's school principal as a representative from the administrative level at a primary institutional setting providing ongoing care to M (principal);

5. a person from the Province of Alberta's Children's Services government sector, as a key informant who has research and policy development responsibilities (government representative);

6. the Province of Alberta's official Children's Advocate, as a key informant and a community member with a history of involvement in community initiatives for children (child advocate); and

7. inter-sectoral and public participation documents from policy, organizations, institutions, and other community sources that had the potential to affect M and her caregivers directly or indirectly, as well as the potential to affect all children.

Data Sources

The database subunits for the case study were created from sources of data representing each of the phases of the Adaptation of the Precede-Proceed Model for Ecologically Sustainable Community Planning and Evaluation (Green et al., 1996, p. 177): the administrative and policy vision, the educational and organizational vision, the quality of life vision, the global and community vision, implementation, process evaluation, impact evaluation, and outcome evaluation. Persons representing the micro-, meso-, exo-, and macro-systems of the child, as described above, were interviewed; and verbatim transcriptions were made. Extensive policy and community documents were used to explore the community linkages or proposed community linkages within the ecosystem that supported the development of a healthy childhood. Institutional and

community documents from a cross-sectoral view of regional, provincial, and federal level documents were included (Appendix A).

Data-collection emphasis is summarized in Table 1. The extensive number of data sources, their depth, and the use of a data-collection framework contributed to study validity through triangulation of data sources for the case study. Although only one child anchored the case study, all participants were asked to speak about the context of all children. Purposeful sampling increased validity by including those eminently qualified to speak about M and other children, through personal experience and level of responsibility for children in the Province of Alberta. In addition, the extensive document list reviewed included government reviews, policy, and community documents, which reflected a breadth and depth of views from many people in the various sectors and community who had been involved in document consultation. Such inclusion increased study validity beyond the context of one child.

Data-Collection Methods

The administration of the Edmonton Public School system and the Capital Health system involved in the child's case were approached through their research and ethics channels. The purpose of the study, the nature of participation, and a request for consent to approach a child, a parent, and professionals were discussed. Permission was granted to conduct the study. There were two data-collection methods.

Document Review

The purposeful sampling of policy and community documents informed by the Precede-Proceed model (see Table 1) included 45 documents selected to span federal, provincial, regional, and institutional representation for M and for all children (Appendix A) . They encompassed the following: federal-level planning and research documents; provincial government business plans from Health, Learning, Children's Services, and Justice sectors; provincial government Health, Learning, and Children's Services sector planning documents; provincial stakeholder documents; regional authority and regional board business plans from Health, Learning, and Children's Services sectors; regional Health, Learning, Children's Services Authority, and board program and planning documents; regional institutional documents; and regional

Table 1

Summary of Data Collection Emphasis Within the Ecosystem Levels, Organized According to the Adaptation of the PRECEDE-PROCEED Model (Green, 1996)

Model	Phase	Micro, meso, exo, macro-system emphasis	Research questions
PRECEDE			
	Administrative and policy vision	Policy/governance analysis: areas of children's service integration, public participation, roles and responsibilities	1. What are the goals according to each perspective for linkage structures, processes and outcomes
	Educational and organizational vision	Child, family, professional, institutional focus; service integration for children, public participation, roles and responsibilities	2. What are the outcomes of successful and unsuccessful linkage for children, families and communities
	Quality of life vision	For the child, family, professional, institution, policy, community	3. What are the barriers and facilitators for linkages
	Global and community vision	Breadth and depth of perspective; institutional effect; integrative process; roles and responsibilities	4. What are the indicators of successful linkages in structures, processes, and outcomes
PROCEED			
	Implementation	Perspectives for M and for all children; intra-sectoral and inter-sectoral contributions	
	Process evaluation	As above; integrative elements; roles, responsibilities	
	Impact, outcome evaluation	For M and her family, for all children and families, for policies, institutions, communities	

Note: All documents were sourced in all phases. All interviewees (see participants) were sourced in all phases.

documents describing public participation. The document dates spanned approximately seven years for historical perspective. See Appendix A for a list of the documents accessed and Appendix B for the document template used for document analysis based on the research questions

Participant Interviews

The child and family were selected from a child health clinic population. Two physicians, two teachers, and the principal who participated in her care were interviewed. A letter was sent to the Children's Services Ministry with a request for a study participant at the policy-planning level. A participant was suggested who agreed to participate. The Provincial Children's Advocate was also approached and agreed to participate in the study. Consent from all participants was obtained. A semi-structured interview format was chosen because the respondent groups were not homogeneous with respect to writing, reading, and verbal ability and were from a variety of backgrounds and ages. The semi-structured interview process allows for self-reporting, validation of response, and clarity. Children benefit from both the flexibility and the framework of a semi-structured method. Interview questions for the child were reworded to accommodate the understanding of 5- to 12-year-olds. Socio-demographic information and knowledge of the participant's health challenges were collected during the interview. Two pilot interviews were carried out. The results appear in Appendix B.

Information about the purpose and confidentiality of the interview was provided at the beginning of the 60- to 90-minute interviews. The questions to be asked of each perspective, guided by the research purpose, research question, and sub-questions for linkage patterns required in the broad areas of linkage structure, process, and outcomes, were explained. See Appendix A for the guiding questions that were used for the interviews. During the study interviews a full description of the participants' perspectives was encouraged. Clarity of wording and readily understandable terms were emphasized. The interviewer used active listening. The interview with the child occurred with the parent present, in a comfortable, familiar room for the child, with few distractions. The interviewer clarified the meaning of each question as needed. The interview with the child was half an hour in length. One break was taken during the interview; a drink was

provided. The interviews were held in settings that the interviewees described as comfortable and that had minimal distractions.

Data Analysis

A presumption for this research was that there are community linkage patterns that encourage an integrated approach and healthy child development. It was further presumed that the linkage patterns of support will be accessible to/by the child in her environment. The objective of the analysis was to identify the evidence for the presence of these patterns of community linkage. A linkage was considered any structure, human or non-human, that connects or ties; for example, organizational structure facilitating process and involvement or the sharing of physical and human resources, monetary resources, or communication sources.

The database constructed using the Precede-Proceed model (Greene et al., 1996) was analyzed using the Adaptive Methodology for Research on Ecosystem Sustainability and Health (AMESH; Murray et al., 1999). The tracing of linkage patterning through the systems required five passes through the database. They are described in Table 2. Analysis was undertaken "horizontally" across the sectors involved in the child's life (Health, Learning, Children's Services, Justice) and for public participation within all of these sectors, using each of the micro-, meso-, exo-, and macro-levels of the child's ecosystem. It was also undertaken "vertically" from the micro- to macro-levels of the child's ecosystem, within each of these sectors, including public participation (see Figure 2). The sustainability of each ecosystem level, as well as the sustainability of the whole ecosystem, was assessed for M and for all children in Alberta.

Qualitative data analysis was the primary approach. Through content analysis and constant comparison, concepts were named, categories defined, and their properties, dimensions, and relational statements described and developed. These were used to identify the linkages in the data. For interview data, concepts were discovered by allowing them to "emerge" (Strauss & Corbin, 1998, p. 33) from the text. In this process open coding or first-level coding was used to describe the concepts, which remained as close as possible to the participants' meanings. The second step in coding, the selective coding, was carried out to determine the significant categories that the concepts fit. Relationships and interconnections between the categories were analyzed, and diagrams

Table 2

Data Analysis Phases, Activities, and Products

Analysis phase	Analysis activity	Analysis products
Raw data	• Conversations, using the guiding questions (see Appendix B) were held with nine participants.	• 142 pages available upon request
	• National, provincial, regional, institutional and public participation documents across the sectors of Health, Learning, Children's Services, Justice were collected.	• 45 documents described in Appendix A, available upon request
Primary analysis	• QSR N5 software from NUD*IST for qualitative analysis was used with each conversation. The elements of the research questions (roles, structures, processes, outcomes, barriers, and facilitators of linkages) served as organizing categories. Each eco-subsystem level (micro, meso, exo, macro) was targeted for this analysis.	• 211 pages available upon request
	• All documents were analyzed in the same way according to a template (see Appendix A).	• 73 pages available upon request (example in Appendix B)
Secondary analysis (AMESH)	Historical Reconstruction	
	• The document templates were sorted according to date, sector and ecosystem level. The time sequencing, movements, and comparisons of the various institutional, regional, provincial and national areas were documented. The descriptions presented in the conversations also added to historical reconstruction to describe the context of the ecosystem where M lived.	• 121 pages sequenced in time and ecosystem level available upon request

(table continues)

Analysis phase	Analysis activity	Analysis products
	Stakeholder Analysis	
	• The primary analysis of the conversations was summarized into a series of charts that described the state of linkage roles, structures, processes, outcomes, barriers, facilitators in each eco-subsystem level according to the nine participants	• Charts available upon request (example in Appendix B)
	• A synthesis statement of each document, taking other documents into consideration was produced.	• 48 pages available upon request
	Multiple System and Linking System Descriptions	• Appendix C
	• The chart analysis of participant interviews from the stakeholder analysis were reanalyzed to describe linkage roles, structures, processes, outcomes, barriers, facilitators in the micro, meso, exo and macro subsystems within the ecosystem, with each of the other level's perspectives as data.	Linkage of System Descriptions: Eco-subsystem Analysis
	• The document synthesis statements from the stakeholder analysis were reanalyzed to describe the sector's input to linkage roles, structures, processes, outcomes, barriers, facilitators in each eco-subsystem level.	
Tertiary Analysis (AMESH)	System Synthesis	• Chapter 4
	A synthesis of linkage structures, processes, outcomes, barriers, and facilitators was completed for the micro, meso, exo and macro subsystems.	Linkages: A Whole System Synthesis
	The horizontal synthesis used a horizontal analysis of linkages across Health, Learning, Children's Services sectors, including inter-sectoral initiatives and public participation, for the micro, meso, exo, macro eco-subsystem levels (Figure 2).	

(table continues)

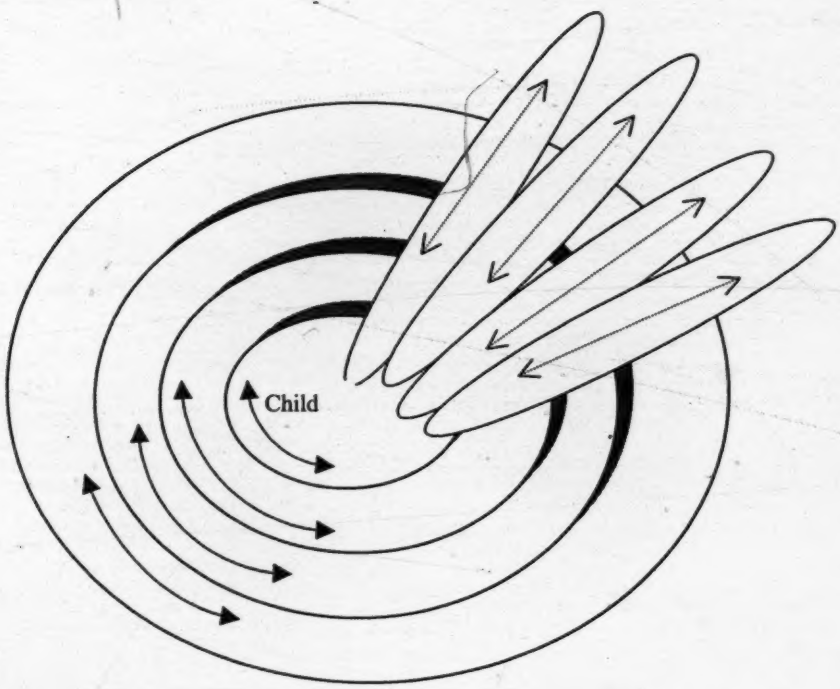
Analysis phase	Analysis activity	Analysis products
	• The vertical synthesis used a vertical analysis of linkages within each of these sectors, and within public participation, from the micro to the macro subsystem levels of the ecosystem (Figure 2). • An ecosystem level synthesis for the sustainability of the micro, meso, exo, macro subsystems of the ecosystem was completed • A whole ecosystem synthesis for sustainability for M and for all children was completed	
Summary: For Implementation (AMESH)	Supportive linking patterns according to linkage structures, processes, outcomes, barriers, and facilitators were identified and described. They were discussed in the context of systems theory (Table 3).	• Chapter 5 Ecosystem Linkage Patterns That Support Healthy Childhood

were used to illustrate the concepts. Finally, the findings were discussed in relation to relevant literature (Morse & Field, 1995).

In summary, separate systems approaches were used to direct different aspects of the case study. First, the overall conceptual organizer for the case was Bronfenbrenner's (1979) ecological systems model. Second, the data sources within the subsystems were identified using the Precede-Proceed model, an ecological framework to guide data collection. Finally, data analysis was directed by AMESH, used as an ecosystems analysis tool. Data collection was primarily through document review and semi-structured interviews. The data management and analysis is summarized in Table 2.

Research Standard

The complexity of the case study gave rise to concern for rigor. Two threats to validity in the form of *social desirability* and *acquiescent response set* may occur (Brink & Wood, 1994). Because the interview as a data source involves face-to-face interaction, "social desirability," in which questions are answered to flatter the respondent or respond



Legend:

Horizontal Analysis of ecosystem levels (cross-sectoral including public participation)

Vertical Analysis (intra-sectoral) of Health, Learning, Children's Services, sectors and public participation

Figure 2. Horizontal and vertical analysis of a child's ecosystem.

to the interviewer's bias rather than describe the truth, may threaten validity. One example would be a response that protects the institution or sector involved. As well, "acquiescent response set," in which respondents have a tendency to agree with the questions or the interviewer, can threaten validity in the study. For example, professionals or parents may want to answer in a socially acceptable way, or a child may want to agree with the interviewer when the questions are not understood. The importance of sincere, truthful answers was carefully explained to the child and the adults at the beginning of the interviews. The adult semi-structured interview was piloted with a parent and a principal to increase feasibility and face validity of the interview. All interviews were transcribed to computer disk from the tape recording of the interview.

There are three principles for the development of a study database: illustrative evidence from multiple sources, the ability to converge evidence, and the availability of a chain of evidence (Yin, 1996). Constructing the case study database from multiple sources using the theoretical framework in the Adaptation of the Precede-Proceed Model, and use of the previously tested AMESH research process, increases reliability in the study. The multiple sources of data contributed to evidentiary adequacy or sufficient depth of evidence (Erickson, 1986; as cited in Morse & Field, 1995). The ability to triangulate the data sources contributes to construct validity in the study.

Use of the AMESH research process analytical framework enabled the tracing of linkage patterns at a systems level using data gathered using the Precede-Proceed model to answer the research question and subquestions from multiple perspectives. In addition, a proactive search for "disconfirming evidence" (Cresswell, 1998) was undertaken by reviewing the data to check the conclusions made by the researcher to counteract a bias toward confirmation. Verification with related literature was carried out. Adherence to these principles was used to increase the construct validity and reliability of the study. Case study analysis may result in "analytical generalization to theory" rather than statistical generalization (Yin, 1996). Case study analysis may also result in "naturalistic generalization" (p. 154), which develops generalizations that can be learned from a case.

Ethical Considerations

The proposal was submitted to the Health Research Ethics Review Committee for Capital Health, the Faculty of Education research review process, and Edmonton Public Schools. An information letter explaining the purpose and benefits of the study, the extent of participation, and the researcher's phone number for questions were sent to all participants (see Appendix A). An information letter in appropriate language was given to the child. A consent form to participate in the study was obtained from all study participants; permission to tape-record the interviews was included in the consent form. It indicated that the taped interview could be stopped at any time at their request and that they could withdraw from the study at any time.

The consent from the parent/guardian of the child chosen to participate in the study was sought before meeting with the child. Parents are legally responsible for matters concerning their children, but proxy consent for the child did not meet the requirements for informed consent from the child. Because proxy consent is not a valid form of consent for children, the consent was reworded in language appropriate for children's comprehension. The researcher met with the child to explain the study, the child's role in it, and the issue of confidentiality. For this explanation, consideration was given to the child's comprehension and maturity. Permission to be a part of the study, using age-appropriate language, was asked in writing of the child. The child could then exercise her right to assent under the conditions of a knowledgeable agreement, which was also assumed subject to her present development (Lindeke, Hauck, & Tanner, 2000). Children 7 to 12 years of age have the capacity to understand purposeful participation in research, but problems exist in ensuring that this assent is made freely (Hymovich, 1997). Many children may not believe that their participation will be confidential. Confidentiality for study participants was maintained throughout the course of the study, and the data were available only to the researchers. Access by others was in the form of anonymous results only. Coding was used to ensure anonymity. Consent forms and identifying data will be kept in a locked cabinet for seven years.

CHAPTER IV

LINKAGES: A WHOLE SYSTEM SYNTHESIS

In this chapter a complete view of each of the micro-, meso-, exo-, and macro-systems was synthesized to ascertain their contributions to the sustainability of the whole ecosystem. In addition the contribution of each sector to the whole ecosystem was synthesized. Bringing the ecosystem level charts and the document syntheses together enabled this synthesis in two ways:

1. Ecosystem-level synthesis was carried out "horizontally" across the sectors (Health, Learning, Children's Services, and public participation), for each of the four sublevels of the ecosystem. All ecosystem sublevel descriptions were analyzed for a full ecosystem level view. In this way a more complete view of each of the micro-, meso-, exo-, and macro-systems could be described (see Figure 2).

2. Ecosystem sector synthesis was carried out "vertically"; each participant's or sector's perspective was traced "vertically" through each sector, or public participation area, from micro- to macro-levels of each sector in the ecosystem (see Figure 2).

Synthesis of Ecosystem Levels

Synthesis of Micro-System

Micro-System Structure

The high probability of direct correlation between social functioning and the biological severity of disease was acknowledged by physician A.

Micro-System Process

Home schooling was restarted after the conversation was held with M and her parent to protect M because her immune response had decreased. It is a further stressor.

Micro-System Outcomes

M has retained her hope, courage, and resilience. This is a significant ability due to the influence of social and community support in all children. However, M is not developing academically to her potential. There is a lack of an integrated team approach involving curriculum and other professionals. Though she has a positive, healthy relationship with her family and teachers, this is not enough to achieve the goals of health promotion and ongoing child development.

Micro-System Barriers

M's micro-environments of family and school were supportive and safe, but an inordinate amount of effort was required to maintain them by the few people that were involved. There was insufficient health/learning support. More linkage was needed to sustain the family and the school environment. There was consensus that in the current systems many children remain vulnerable and suffer negative outcomes in their micro-environments at home, at school, and in the community because of lack of support from other subsystems within the child's ecosystem.

Micro-System Facilitators

Additional elements and linkage ability in M's ecosystem are needed. The best possible outcomes for M in the micro-system have been shown to be dependent on other elements and relationships in all of the ecosystem subsystems. This was described as true for all children.

Synthesis of Meso-System

Meso-System Structure

A supportive team structure was not in place for M and her family. Using one of M's specialists as a primary care physician provided constancy of relationship, less stress, and less expenditure of energy, which M's parents valued. For all children, including M, a sharing of power and systematic provision of structure and resources for advocacy are considered essential. Well-linked early childhood areas are essential to develop greater access to linked support for families in the years before school attendance. The creation

of healthy early childhood and school communities was seen as critical. Linkage hubs for services and supports, such as early childhood areas, schools, child health areas, the Neighbourhood Child and Family Centres, and the Community-University Partnership, were identified as structures that would help develop access, constancy, and flexibility of linkage structures and process for childhood. Planning for some of these areas was beginning in some schools and in child health and children's services areas, but linkage structures are not in universally in place.

Meso-System Process

A team approach is needed with closer linkage and communication between parents and health/learning professionals. More involvement by Capital Health to develop coordinated support from the ambulatory care area and within the school are also required. Further involvement including funding from both learning and health sectors is needed to meet M's learning needs.

The meso-system requires the following linkage strategies to fill gaps and provide sustainability of support to promote health. Recent government initiatives have been positive steps toward increasing community linkages. ESHIP in Region 10 is developing coordinated service teams to schools, sometimes with co-location. Strategies such as this will help provide sustained support rather than that achieved "by accident" (M's parent). Support for parent and professional advocacy was identified as an essential element of meso-system linkage. Targeted, culturally sensitive linkage infrastructure to anticipate and support transition between environments for children is critically needed.

Meso-System Outcomes

The meso-system for M lacks strength and sustainability. Relationships in M's meso-system are positive and productive, but gaps remain. Full linkage of the health/learning processes and outcomes had not yet occurred for M and for all children. Lack of role definition, blurred lines of responsibility, and lack of resources have increased the burden on M's mother and influenced other areas. All participants felt that parents need another person or structure from the systems to help navigate the systems and guide support. The parental burden to do this alone is overwhelming and significantly increases family stress. The lack of a cross-sectoral team approach has resulted in gaps in

awareness about the needs of M and her family for additional supportive action. M's primary care physician, also one of her specialists, was trying to manage alone and was well aware of resource cutbacks to ambulatory care, school nurses, and public health and the general lack of availability of community support. That is, schools have developed primarily as educational institutions rather than social institutions. "Full knowledge" is a prime linkage goal of M's parent. She wanted to know as much as possible about M and also wanted M's caregivers to be informed enough to fully support M and her family. This goal has not been attained.

The meso-system for all children is currently developing an increased ability to collaboratively support the micro-systems of the child for improved outcomes. However, dysfunction of the meso-systems for some children is evident because of a combination of underfunding and lack of linkage infrastructure including practice and knowledge toward bringing people together to identify and support needs. Teachers are stressed and left alone to cope with many student needs. Many undetected needs remain from a lack of expertise, time, and resources. A "re-victimization" of the child and/or family by the system is often the result. Community institutions such as families, schools, early childhood areas, child health areas, and others show dysfunction due to lack of successful community linkage structures. A sharing of power and the systematic provision of linkage structures and resources for advocacy are not always present. It is difficult for the parent to maintain the role of prime informant of the systems. Many parents and professionals are unaware of services available for children. Therefore the desired linkage goal of "full knowledge" (parent) for childhood had not always been attained for professionals and institutional and community environments.

Meso-System Barriers

All of those involved wanted success and resilience for M and for all children, but they were not confident that they had the means, resources, positions, knowledge, and linkage infrastructure to provide it. There are significant exo-system barriers due to a lack of role definition, blurred lines of responsibility, and lack of resources. An interdisciplinary and cross-sectoral team approach has not been implemented with M and her family. Consequently, it is difficult to determine who should relay information or take the initiative and when. The current linkage breakdown has occurred at the interface

between institutional structures: the family, the child health clinic, and the school. A lack of linked structure, process, and resources directed toward a coordinated plan of support is evident.

Roles and handoffs lack clarity for many children (government representative). Many children and families do not receive sustained support beyond the assessment level because of the inability of the large systems to effectively reach the child and family level. A great lack of trust and lack of "receptivity" (child advocate) has developed among systems, particularly when working with children and youth with more complex vulnerability, such as those in child welfare. Barriers include the lack of ability to carry out needs assessments, implement remedial linkages in school communities, and implement a sufficient depth of support to students. There is always a lack of resources reaching the family and professionals. The school's institutional role as both social and pedagogical, which requires work with other community partners to build healthy school communities, is implied but not sufficiently detailed in current policy. As a result, the risk of failure at the implementation stage and a lack of proactivity become significant possibilities. All participants identified the unmet need for multiple disciplines to be able to have greater access to children in schools. Targeted, culturally sensitive linkage infrastructure to anticipate and support transition between environments for children, with or without natural advocates, remains a major need.

Meso-System Facilitators

All participants felt that parents, including M's parents, need another person or systemic structure to help them navigate the public systems and guide support. Descriptions from all systems show that synergy is a goal, but more knowledge about what coordinating and linking structures to put into place, and where, is required. Knowledge on how to effectively implement linking structures and processes that interface institutional, sectoral, and other community structures is crucial. As M's case reveals, more linkage structures are needed between families, ambulatory child health areas, schools or early childhood areas, and other children's services. Principals currently retain the role of designated gatekeepers for the ESHIP initiative. However, M's principal stated that a linkage structure, including more community and professional representation than a school council, would be a helpful facilitative linkage structure at the school level

to promote ongoing interdisciplinary and community support for the school. A similar structure may be a useful linkage facilitator to early childhood environments.

All participants identified the unmet need for other disciplines to access children in schools to identify and meet needs. Another significant linkage goal is closer linkage between schools, children's ambulatory care areas, and other major service hubs for children and youth. Supportive service system linkage structure needs to be in place to accompany this essential element and ensure coordination, provision of service, and knowledge sharing. Creating a "community forum for childhood" (physician B), bringing together researchers, practitioners, and other community members, was described as a linked structure that has potential to increase knowledge sharing and excellence of professional and community practice.

Synthesis of Exo-System

There was consensus that exo-level linkage affects all ecosystem levels. Activity at that level could facilitate or create barriers within ecosystem levels. There is potential to encourage advocacy by bringing parents/public together to communicate needs. Though study participants and documents readily described linkage goals for structures, processes, and outcomes, the specific linkage infrastructure to be put into place for implementation of the desired linkage goals was minimally described by the study participants or documents.

Exo-System Structure

The Alberta Children's Initiative stimulated a context of reform and innovation within government and with communities. Several major initiatives and reviews were undertaken. However its depth of development, and lack of sufficient inter-sectoral funding is markedly insufficient. There is a lack of inter-sectoral linkage infrastructure among government sectors. The newly formed Community-University Partnership for Study of Children, Youth, and Families and the Government of Alberta's children's forums are developing knowledge-sharing abilities.

Exo-System Process

In light of recent inter-sectoral provincial government initiatives for children (e.g., the Healthy Families Initiative, ESHIP, the Children's Mental Health Initiative), the development of standards for integrated practice and performance measures and outcomes that reflect the inclusiveness of inter-sectoral responsibility and community participation are required. These are essential to assess the effectiveness of continuums of care. Greater policy development in each sector is now essential to support this inter-sectoral accountability with planning, resources, and practice. There is increasing recognition and emphasis that "the educational role of schools is also a social role of the institution" (government representative). In addition, it is evident that service hubs for child health and children's services need to enhance their educational and social roles and responsibilities. These ends require a greater depth of community understanding and participation. Sustainability requires operationalizing from an organizational structure and process perspective and a recognition of what outcomes these generated.

The vision and context for more efficient linkage infrastructure in the exo-system are being formed. What is needed now is the further development of linkage structures and processes that increase boundary permeability among sectors and communities.

Exo-System Outcomes

The micro- and meso-systems for M, at 10 years of age, had not yet fully benefited from the developing exo-level linkage infrastructure in the province. Exo-level development has not reached the micro-systems of many children. There is evidence of hope and promise within recent initiatives, and these are starting to define the context for children, families, and communities. However, there are insufficient funds committed by government to meet children's needs. There is some evidence of flexible funding strategies and development of wrap-around services. Examples include the Healthy Families Initiative, ESHIP, the Children's Mental Health Initiative, and the Child and Family Neighbourhood Centers. The exo-system is developing its linkage ability. Government initiatives promoting linkage are developing, but supportive linkage does not always reach children's needs in their micro-levels. Proactive, health-promoting linkages have not been fully implemented. Some areas of support are grid-locked

(ecosystem level charts available on request). Linkage infrastructure to provide more education regarding the rights of children, families, and communities to enable wise community decisions and practice is currently not strong. Linkage structures for knowledge sharing are increasing, and each sector has begun to develop its ability to share knowledge of services and resources. There remains a need to bring these together to enable easy access to all those supporting children.

In summary, the system has not yet attained large-scale implementation of successful coordinated linkage structure and practice in service sectors and in the public community. All participants stated that failure to implement boundary permeability among sectors and communities results in structures left at boundary perimeters without the ability to penetrate the institutional realities for children in their micro-system. The failure of society to cope with child, family, and community vulnerability and achieve the goal of healthy development is the result.

Exo-System Barriers

Barriers remain significant. They include practice issues, insufficient sharing of knowledge, and lack of resources in the systems despite a large government surplus. For many children the system intervenes at crisis points rather than providing long-term, sustainable depth of support. Wage structures often do not show the monetary valuing of those who provide essential services for childhood. There is not enough recognition of school -community linkage structures as potentially powerful sources of strengthening schools and early childhood sites, service sectors, and communities. Initiatives to engage the Aboriginal community to encourage mutual linked support required stronger effort. The child welfare system lacked linkage infrastructure to other sectors and community support to facilitate this support directly to micro-environments of children/youth and families at risk.

The development of a parent network involving parent associations, parent advisory groups, school councils, early childhood parent groups, and parental associations for special-needs children to increase access to parents in the province for advising, consulting, and knowledge sharing purposes have not been put together. A sustainable, integrated "picture" of linkage structure including services, supports, and knowledge of childhood that is easily accessible to all professionals, families, and

communities has not yet been formed and was requested by all study participants. There was agreement on what roles should be in place, but there was a lack of clarity on what structures and processes should carry them out. For example, "handoff" (government rep.) to other sectors was considered a significant barrier. Standards for integrated practice, including public participation, are not yet in place. Failure to develop linkage infrastructure results in structures left at boundary perimeters often without the ability to penetrate the institutional realities for children and families.

Exo-System Facilitators

The child advocate stated that structures with joint planning and accountability and a service orientation are effective large-scale facilitators. According to teacher A, the time is right for regional action plans involving all sectors to develop large-scale, inter-sectoral, linked support to children, youth, and families. More coordinated cross-sectoral and community team structures are needed at micro-, meso-, exo-, and macro-system levels. Guidelines for interdisciplinary and community practice that will provide "wrap-around support" for children and families were considered helpful by most. According to the child advocate, standards for core services for children and youth, as well as the facilitation of integrated community linkage practices, are needed as exo-system linkage facilitators that are not in place. Linkages to develop public advocacy require more structures and processes to promote their development. Education for both parents and professionals concerning the role of advocacy is also required, and a need to educate parents about current government initiatives is evident. Government task forces demand creative ways to share knowledge and help resources reach parents, but the development of a parent network has not been put into place for advisory, consulting, and knowledge-sharing purposes. Although each sector has begun to develop its ability to share knowledge of services and resources, there remains a need to bring these together to enable easy access for all those supporting children. There is a need to know what sustainability "looks like."

Synthesis of Macro-System

Macro-System Structure

Evidence from participants and documents indicate that children, families, institutions, and communities, under current societal conditions of uncertainty and opportunity, have a need to connect with one another to support healthy child development. This was considered a vital element for the responsibility of raising healthy children and coping with their vulnerability in complex situations. As stated by the parent, ultimately, it is "not an individual world, . . . whether we like it or not."

Lack of sufficient coordinating linkage structure around institutions, families, and communities is preventing a macro-scale sustainable effort for childhood. It is also preventing optimal healthy development of ecosystem components. Alberta has set the stage toward moving in a direction that can facilitate and sustain support to childhood. The government representative hoped that increased emphasis would now be placed on concretely valuing children and families, as the baby boomers move forward from a focus on work to a broader community vision.

Macro-System Process

The implementation of macro-level linkage to sustain a healthy childhood is progressing, but it requires greater effort for complete implementation. The valuing of children and developing linkage for children remain rhetoric at many levels. Catalysts are needed to create impetus for linkage and to create more awareness and higher levels of cohesion, especially across sectors and large-scale community regions. Developing levels of linkage that are proactive and health promoting have not yet been achieved for all children. The promotion of ongoing community learning was identified as essential to achieving this linkage goal. One example is that health authorities systematically rarely meet as a group within the province, making provincial perspectives harder to develop among the authorities. Increased linkage to increase the ability to share information across the regions is needed. It is evident that the constancy of linked community support, an essential ingredient for healthy childhood, requires significant strengthening in the early childhood years, through school-age years, including the more extended periods of

adolescence often seen in disadvantaged youth. It is needed for the child, the family, and community, to create sustainability of linkage and its outcomes.

Macro-System Outcomes

There was evidence from the macro-system documents reviewed of the critical need for macro-system linkages to have the ability to fit varying micro-, meso-, and exo-system contexts for childhood. All of the desired macro-scale linkage outcomes described by participants and the documents focused on the abilities to contribute to the state of health in children, families, and communities. They aim to help people help themselves and each other. The health/learning linkage is a major ongoing goal for parents and professionals. Moving institutional environments to that end has not occurred on a large enough scale, and many inconsistencies and gaps in support remain. The documents expressed major goals that set the context for linkage. However, the linkage infrastructure to implement these goals, according to the participants, is often lacking. Knowledge on how to put the most effective linkages in place across societies and provinces has not been sufficiently developed.

Macro-System Barriers

Significant barriers include a lack of knowledge concerning the supports available for childhood and about who and how to interrelate the elements within the ecosystem. There is a lack of knowledge about how health and learning are interlinked and what societal linkage infrastructure should be put into place to recognize this linked concept. It was recognized that finding ways for developing linked support to balance society's emphasis on work and productivity, with its valuing of childhood, is a critical goal for macro-level linkage. There remains a lack of research on how structuring in our environments, in natural systems and human-made environments, influence outcomes for childhood at molecular-biological levels.

Macro-System Facilitators

The strength of linkage structures and processes in society, including among federal, provincial, and regional areas responsible for children, was identified as an essential facilitator of health for all children and youth. Federal structures that serve to

support Aboriginal children require strong linkage with provincial initiatives and linkage infrastructure. Major facilitators of macro-system linkage described by participants and documents were the broad sharing of knowledge as a resource within communities, the development of knowledge about societal linkage structures and processes and their successful implementation, the development of healthy early childhood and school communities, a focus on healthy living, and investment in more research on how elements within the ecosystem affect health and the severity of disease.

Sector Analysis

Learning Sector

At the macro-level of linkage, federal level documents on processes did not show a strong health-learning linkage. The *Early Years* study (Mustard & McCain, 1999) identified this as a "significant divide." Education is a provincial jurisdiction only. This leaves critically important areas such as early childhood development and the development of healthy school and early childhood communities with uncertain, inconsistent, inequitable linkage contributing to the lack of recognition of needs. The recognition of the importance of developing inclusive "learning communities" has increased. At the exo-system level, increased planning for the role of the school as a social, in addition to a pedagogical institution, is evident. However, the planning has not emphasized all the elements needed to develop and sustain healthy early childhood and school communities. There is a lack of coordination and linkage structure among government funding initiatives for schools to accomplish this goal. Connections among some of the early childhood elements are developing to increase continuums of care. The Province of Alberta Student Health Initiative Partnership (SHIP) encourages services to children at schools, but implementation strategies and expenditure of funds are varied throughout the province. All plans have to be inter-sectoral in nature to qualify for SHIP funding.

There is some evidence of increased planning to promote successful transitions between learning environments. Development of a "framework for consultation strategy" as described in Health planning, has not been mentioned as a linkage goal for Learning. A stated facilitative linkage goal of the Learning business plan is to closely link the

ministry's business plan and its human resource plan. Underfunding for service to provide linkage structure remains a significant barrier identified in study conversations. The Province of Alberta's Special-Needs Review aims to begin an update of the Learning system's needs in this area and make recommendations for greater clarity of special needs criteria and accountability in the provincial learning system. The sharing of promising practices using a provincial focus is slowly increasing. One example was the first Alberta Initiative for School Improvement forum.

At the meso-level, strategies for developing healthy school communities are beginning, but are inconsistent among schools across the province. Roles and responsibilities at the school and community levels lack clarity, but discussion is evident. Linkage structures at schools are very inconsistent, with the outcome that access to other disciplines and the sharing of decision-making power are inconsistent among schools across the province. The Edmonton Public School Board document analysis indicates a lack of sufficient depth of policy to promote meeting student needs in healthy school communities in a proactive manner. It does not sufficiently promote systematic facilitation of community linkage infrastructure using sustained inter-disciplinary and community support at the school environment to meet children's health/learning needs, including systematic promotion of public participation. School councils in geographic areas are often not interrelated among themselves, nor do they have productive linkages with their boards to develop abilities to advocate regionally, to cope with collective needs, and to learn from each other. The lack of such linkage structures has compromised the meso-system's function to contribute to M's healthy development.

In M's micro-system, she is not funded for her learning needs that result from her condition of Omenn's syndrome because she has not met the current "special-needs" criteria. In addition, the school budget does not permit a classroom aide to bring extra help to those students who need it. School staff expressed a desire for more help and knowledge about how to create a supportive and healthy learning environment for M. Processes that proactively include parents' supportive involvement and skills, along with professional expertise, to benefit class learning and the school community are very limited.

Health Sector

In the macro-system, the Canada Health Act with its principle of universality appears to be interpreted by government business plans as covering hospital and physician services, but not necessarily comprehensive community care. As reported by Physician B, payment for drug treatments is often not covered if they are delivered at home. The health sector at the federal level supports the development of healthy school communities. The Province of Alberta's Health ministry's three-year plan recognizes the need for a learning organization culture. However, there are few measures and accountabilities for the health role in primary and secondary levels of service. The provincial business plan does not focus on this area. There is no mention of the importance of participation in joint, integrated initiatives for children's healthy development, including at the institution of the school. There is no provincial health accountability framework for children, as there is in the Ministry of Children's Services. Planning for integrated single point of entry children's mental health services is under way. Provincial public health targets are narrow. The health sector's participation via the inter-sectoral SHIPs, using the institution of the school, has begun across the province. Funding and practice strategies vary considerably among regions. The SHIP initiative has not been researched, and the sharing of best practices has not yet occurred. Greater linkage ability for knowledge sharing is being developed; for example, Alberta Wellnet, the School Health Resources website, and participation in the Community-University Partnership (CUP).

Because geographic boundaries for Health Authorities, Children's Services Authorities and school boards are not co-terminous, Capital Health has had to participate in nine partnership agreements for the Student Health Initiative Partnership. Interdisciplinary service teams have been put into place in Region 10 through ESHIP, including for early childhood services. Measures of accountability for children's health in the regional business plan are very narrow, and joint initiatives such as ESHIP will require the development of performance measures and outcomes that reflect more accurately the accountability and the involvement of each system. Furthermore, a stated goal for the Capital Health region is to develop a framework for a consultative strategy within Region 10.

Capital Health is beginning to convert to multisite information systems. Health councils provide valuable community input to health authorities. They do not have a process with school councils to increase knowledge of needs and of strategies for advocacy. Regional health authorities do not meet as a provincial group in a systematic way, making it more difficult to share ideas of common goals and practices across the province. Regional representation from Capital health on the CUP steering committee from both the community health and the child health program has developed as an important facilitator of linkage.

M's mother stated that the link to ongoing community support through the ambulatory care level has been weak. The availability of more support from nurses at the ambulatory care level and at the school level has not been in place and was identified as a critical linkage goal by most participants. Children's hospital site policy is not in place to promote proactive, integrated, community linkage. Currently, there are not enough services funded to meet health needs, according to the participants and documents. In the meso-system, the development of a Region 10 child health program framework for integrated planning of ambulatory services for children is now a proposed, future regional linkage goal.

Children's Services Sector

At the exo-level, the Alberta Children's Services ministry business plan is aimed at capacity building and an appreciation of inclusion of networks, and it has a systems perspective. Partnering with inter-sectoral initiatives is a stated linkage goal. The Children at Risk Task Force has called for a "community service plan for children," but it has remained a current significant gap. Developing a continuum of relief services for children and for services to children with disabilities is a desired goal for development. The Children's Advocate Review described the advocacy role for children as a responsibility of all systems. The review's suggestion that the Office of the Children's Advocate report to the legislature rather than the Minister of Children's Services reflects the inter-sectoral nature of meeting child and family needs. Documents and conversations indicated that there remain severe difficulties, including a lack of linked support, for children cared for in the child welfare system. It was also recognized that early childhood areas need significant development. The evaluation of the Healthy Families project

indicates that a closer linkage with Children's Services infrastructure is needed for these programs. The second Provincial Government's Children's Forum was being planned to increase provincial community linkage. Much stronger linkage development between sectors is required to meet the government and sectoral goals for children's healthy development. Under-funding of services was identified by all participants as a significant barrier. A noted facilitator of linkage is the provincial representative from Children's Services as a member of the steering committee for the Community-University Partnership for Study of Children, Youth, and Families.

At the meso-level, the new Children and Family Services authorities have been increasing their abilities for several years. The Neighbourhood Child and Family Resource Centres are beginning to develop and have flexible funding pools. In Region 10, Children's Services has been participating on the ESHIP service teams to schools as providers of emotional and behavioural services. Other areas in the province do not have this kind of participation in service strategy. M's mother found out about funding support from Handicapped Children's Services "by accident" rather than from consistent linkage. A lack of easily accessible information about childhood services, supports, and knowledge was considered a significant barrier to linkage by all participants.

Public Participation

At the macro-level, active linkage to put parental support and public participation in place is a major recommendation of the *Early Years* study (Mustard & McCain, 1999), because it was found to be a significant gap. At the exo-level, participation or consultation by parents on recent provincial reviews is evident, though at a minimal level. For example, inclusion of parents in the planning groups of major provincial initiatives and reviews occurred recently for the Alberta Initiative for School Improvement and for the Community-University Partnership, but not for the Safe and Caring Schools or Edmonton Student Health Initiative. However, a parent advisory group for the Region 10 ESHIP is now in place. More vehicles of public participation have been legislated or formed; for example, school councils, health councils. They are becoming active community voices to administrators and to boards and regional authorities. Process to link school councils as a geographic group to their elected trustee is not a common, systematic practice. Trying to increase school funding is often a major school council

agenda rather than the perusal of larger school community goals, and skill levels to broaden the council's agendas are developing. Time to actively develop school-community partnerships was described as very limited. It is also not practice to develop linkage process with health or Children's Services advisory councils. These councils do not have regular linkage process that is provincial in nature to share knowledge and needs and increase agency and synergy. Use of a parental network in the province involving advisory councils and parental associations as a linkage practice has not been put into place to increase public participation, the sharing of knowledge, and the strengthening of institutions and communities.

At the meso-level, M's school council was described as active and strong, though small in number. The bylaws of M's school council do not have committee formation to develop school community linkage. Neighbourhood Child and Family Centres in Region 10 for Ma'Mowe Children's Services Authority are developing community councils. The child health service hubs do not have systematic public participation in place at this time.

At the micro-level, throughout the course of M's illness, M's mother has had many occasions during which she felt that their stated needs were not being validated; she has felt overburdened and left alone to try to figure out the systems and guard against damage to M. Increased family stress has been the result. However, due to active positive interrelationships with caregivers, M has retained a feeling of being protected within her micro-systems. All participants and some of the government reviews highlighted the lack of access to an integrated source of information on childhood services and knowledge resulting in a decreased public ability to advocate, participate, and strengthen the voice for children and youth.

Ecosystem Sustainability

The following analysis is a synthesis of the overall ecosystem sustainability based on the subsystem analysis above.

Sustainability For M

The analysis in the study has allowed a brief glimpse of M's ecosystem. These descriptions evidence the complexities of elements in the micro-, meso-, exo-, and macro-levels of the ecosystem in which children live. In the macro-system, there is an appreciation of childhood, but there is recognition at all levels of the ecosystem that greater expertise in linkage practice is needed by communities to accomplish such linkage goals as insulating the effects of the economy and the role of or work on children, families, and communities. A lack of knowledge exists as to how to implement linkage structure and process well. Accepting significant accountability for healthy development of society's children is not the current reality. The macro-system itself has not fully attained the health-defining linking abilities to support healthy child development.

In the exo-system, bureaucracies and service systems are becoming more coordinated. Planning to further develop the continuum of care is a goal in all service plans, though integrated community care plans for children and youth are not in place. Planning has been more coordinated, but the linkage structures to implement planning are just beginning to develop. Inadequate linkage infrastructure remains the current norm. Coordination of exo-level planning and resourcing to catalyze linkage around institutions such as the family and schools child health areas that promote and sustain the health of children, institutions, and communities has not yet developed fully. Provincial funding initiatives for students are contributing to developing certain elements in healthy school communities, but there is not sufficient coordination among provincial sectors to address the whole concept of healthy school and early childhood communities in the province. Most notably, the institutions that protect the vulnerability of children are not sufficiently linked within and among themselves and with wider community linkage in patterns that encourage efficiency of effort. The lack of development of standards for integrated practices, and macro-level knowledge to achieve them in society, are major gaps affecting ecosystem sustainability. The exo-system has not yet attained a high level of linkage ability to promote and sustain health and wellness, withstand stress, develop resilience, and promote the greatest possible ongoing development. There remains a lack of human and non-human collaborative linkage infrastructure to create the synergy to

accomplish this major linkage goal for ecosystem sustainability for M and for all children.

Coordinated initiatives for children have begun to meet more specific service needs at the meso- and micro-levels. They have the potential to positively develop professional and community linkage practice. There is a slowly increasing degree of support for the development of public participation and advocacy structures. Infrastructure linking professional services and public participation, two significant elements to create ecosystem sustainability with maximum abilities of linkage, is frequently not in place, though examples of this are beginning to occur. The meso-system is beginning to benefit from exo-level development, but for many children it is still unable to protect vulnerability and provide sustainable healthy development of the child with the abilities of ecological integrity.

The expertise of M's caregivers has contributed to her ability to function well and with resilience in her micro-environments, despite huge challenges. This reflects the abilities that the micro-systems have been able to attain despite lack of linkage in certain areas. These, however, are at significant effort and cost to M's caregivers. M's micro-systems still reflect the lack of linkage infrastructure and the decreased level of abilities in the macro, exo, and meso-system levels. This gap seriously compromises the ability to maintain a high level of sustainability of the micro and meso-systems over the long-term support of M. M herself remains well supported in most areas except for her learning environments and her endurance of chronic levels of stress with which she and her family live. She remains very vulnerable to her environments due to her deficient immune system. These factors have the potential to significantly impact her life.

M's whole ecosystem remains successful at supporting her health in many ways. However, the long-term sustainability of M's ecosystem has been compromised due to stressful overburdening of individual elements and lack of linkage among its elements to sustain the integrated support needed for her healthy development. The healthy abilities of the other ecosystem levels have been compromised, and this directly affects some of M's own health-defining abilities at the micro-level.

Gaps in linkage exist, but the community systems are slowly moving toward more coordinated linkage expertise. There is evidence at the policy level of increased vision, support for cross-sectoral participation, and coordination using varying forms of linkage to produce an integrated effort. The participants concluded that implementation of this vision requires the systematic implementation of coordinated linkage infrastructure, much of which has not been formed because of a lack of knowledge and resources. Geographic areas are spending money differently and have different practices and levels of integration. Greater equity of access to knowledge and other contexts for long-term learning has been declared a major need. More supportive policy and linkage infrastructure that enables increased integrated practice and public participation throughout all the ecosystem levels is essential. To sustain linkage structures, opportunities to interrelate and share knowledge among regions and sites are required.

Significant barriers were described, including the underfunding for human and non-human resources and the lack of efficient, collaborative societal linkage infrastructure and its practice. A vision for healthy ecosystem linkage ability was detailed both in the documents and by participants, but there was uncertainty about the strategies to specifically carry out its implementation. An important direction for implementation that was found within documents and the conversations was the pattern of flexible cohesion to create linkage infrastructure within community systems. Linkages that leverage effect and integrated effort are occurring in some areas, but still do not reach each system level both within and across community systems. Larger infrastructure is forming, but cross-sectoral linkage service hubs with the ability to reach and support the micro-systems of the child are not fully in place.

There was agreement that without much stronger development of expertise in research, which includes epidemiological needs, molecular-biological outcomes of environmental structuring, interdisciplinary and public education, and knowledge-sharing abilities, the sustainability of the ecosystem for childhood is not assured. All participants and documents acknowledged the importance of linkage of community areas to areas of knowledge about childhood and about contributions of other community areas. There are currently many untapped community resources because of linkage gaps. It is apparent

that macro-scale linkers such as the Community-University Partnership (CUP) must develop these kinds of linkage abilities through interrelationships with service hubs, professionals, institutions, researchers, educators, parents, and other areas of knowledge.

Summary

The ecosystem within which all children in Alberta are imbedded, was described by participants and documents as extremely complex. It includes the interrelation of human and non-human elements, but its sustainability is not assured. There is evidence in the ecosystem for M and for all children that community ability to sustain the health of children, families, and communities is slowly increasing. However, the participants strongly indicated that a great vulnerability and lack of protection currently exist at the micro-level for many children, as a result of the lack of larger-scale linkage infrastructure at other ecosystem levels. Negative outcomes for children, in families, institutions, and community environment, that reverberate through meso-, exo-, and macro-levels of the ecosystem are the result. The participants found such outcomes to be unacceptable. Public participation linkages are lacking, and expertise in this area requires much more facilitation by institutional and bureaucratic mechanisms. The analysis indicates that the ecosystem as a whole is not sufficiently linked and has not reached a level of ability that equitably and proactively protects the vulnerability of all children, sustains their health and wellness and their ability to withstand stress, promotes their greatest possible development, and develops their resilience to human interruption. However, the descriptions in this study indicate that there is a vision and an awareness within society's elements that interrelationships using an ecosystems perspective have the potential to create trust, knowledge, and a societal valuing of each other to achieve the goal of a healthy childhood for all children.

CHAPTER V

ECOSYSTEM LINKAGE PATTERNS THAT SUPPORT HEALTHY CHILDREN, FAMILIES AND COMMUNITIES

Linkage patterns are described in this chapter. They are identified through a final pass through the tertiary analysis. The patterns described here are inclusive and constitute a theory of linkage requirements for healthy childhood. The specifics of the linkage patterns can be found in the positive linkage structures, processes, outcomes, and facilitators outlined in each level of the analysis (including the charts and document templates).

The 26 patterns are categorized into three general areas of linkage infrastructure: ecosystem structure, boundary activity, and linkage outcome goals. This categorization is listed in Table 3. The patterns of linkages are the indicators of successful linkage infrastructure that supports healthy childhood. This is the answer to the last research question. Each pattern is named and then described using data from the case. Included is commentary using literature from ecosystems theory and other relevant theory. The patterns use linkage structures, linkage processes, and linkage outcomes. These structures, processes, and their outcomes constitute linkage infrastructure.

Ecosystem Structures

Ecological integrity philosophy is described in some detail in Chapter 2. In summary, ecological integrity is a structural state with the following abilities: to sustain health, to withstand stress, to promote the greatest possible ongoing development, and to continue development unconstrained by human development (Westra, 1998, p. 8). The concept so far had been primarily developed using an environmental natural systems perspective and is applicable to the level of survival. However, children will not survive without a period of adult nurturing that requires linkage. In this case study, in order to include human living systems beyond the state of survival, the term *ecosystem integrity* is used to reflect this state of wholeness of structure and healthy abilities that support healthy childhood. It includes human and non-human elements and is an extension of ecological integrity (EI).

The data analysis supports the existence of eight structural linkage patterns. They are described in Table 3.

Table 3

Patterns of Linkages That Support Healthy Childhood

General areas of linkage infrastructure	Pattern
Ecosystem structures	• structural wholeness, reflects the goal of healthy childhood, and is characterized by feedback in structure and in healthy abilities of both human and non-human elements • focusing healthy childhood community linkage infrastructure toward the four healthy abilities adapted from EI (Westra, 1998) • building leverage into healthy childhood linkage infrastructure • wrapping linkage structures including public participation, around formal and informal institutions • providing multiple points of equitable access to community support • funding human resources infrastructure • making accountable, and rewarding collaborative effective, linkage practice • creating knowledge networks
Boundary activities	• attending to interdependencies in the ecosystem • balancing individual and group rights • strategically strengthening selected ecosystem elements • creating strong linkage between primary (prevention), secondary (ambulatory care), tertiary (crisis) health care levels for a balanced strategy of preventive and crisis driven linkage • building "receptivity" (child advocate) into community systems • developing synergy through boundary activity • facilitating the process of linkage inside the subsystem and outside the subsystem

(table continues)

General areas of linkage infrastructure	Pattern
	• use of leveraged processes at boundary interfaces in schools and early childhood centres • recognizing the key boundary of the interlinked concept of health/learning • recognizing the key boundary of early childhood and school linkage • maintaining cohesion in community systems • an ecosystems perspective for community-based research
Outcome goals (healthy abilities)	• child, institutional, and community health-centred goals, including their molecular biological outcomes • a dynamic response to the child's environment through portability and permeability of boundaries • inclusion and support of public participation • achieving collaborative community linkage infrastructure • preserving a culture of childhood • sustaining the indicators of ecosystem integrity and ecosystem health for childhood because ecosystem integrity, based on ecological integrity (EI), is a determinant of health and health is a determinant of ecosystem integrity

Pattern: Structural wholeness, reflects the goal of healthy childhood, and is characterized by feedback in structure and in healthy abilities of human and non-human elements

The study data describe an overall need for wholeness in the ecosystem for children, families, and communities. Linkages are critical to create the ability for sustainability of health and for healthy receptive environments that nurture this wholeness. These linkages were not meant to create aggregate social, political, or geographic wholes. Rather, they helped ecosystem elements to work together as integrated structures with the goal of healthy childhood, so that "children would realize they are important, special . . . Children would learn the importance of the community as a whole and how it has helped them. . . . We're all linked" (parent). Study participants'

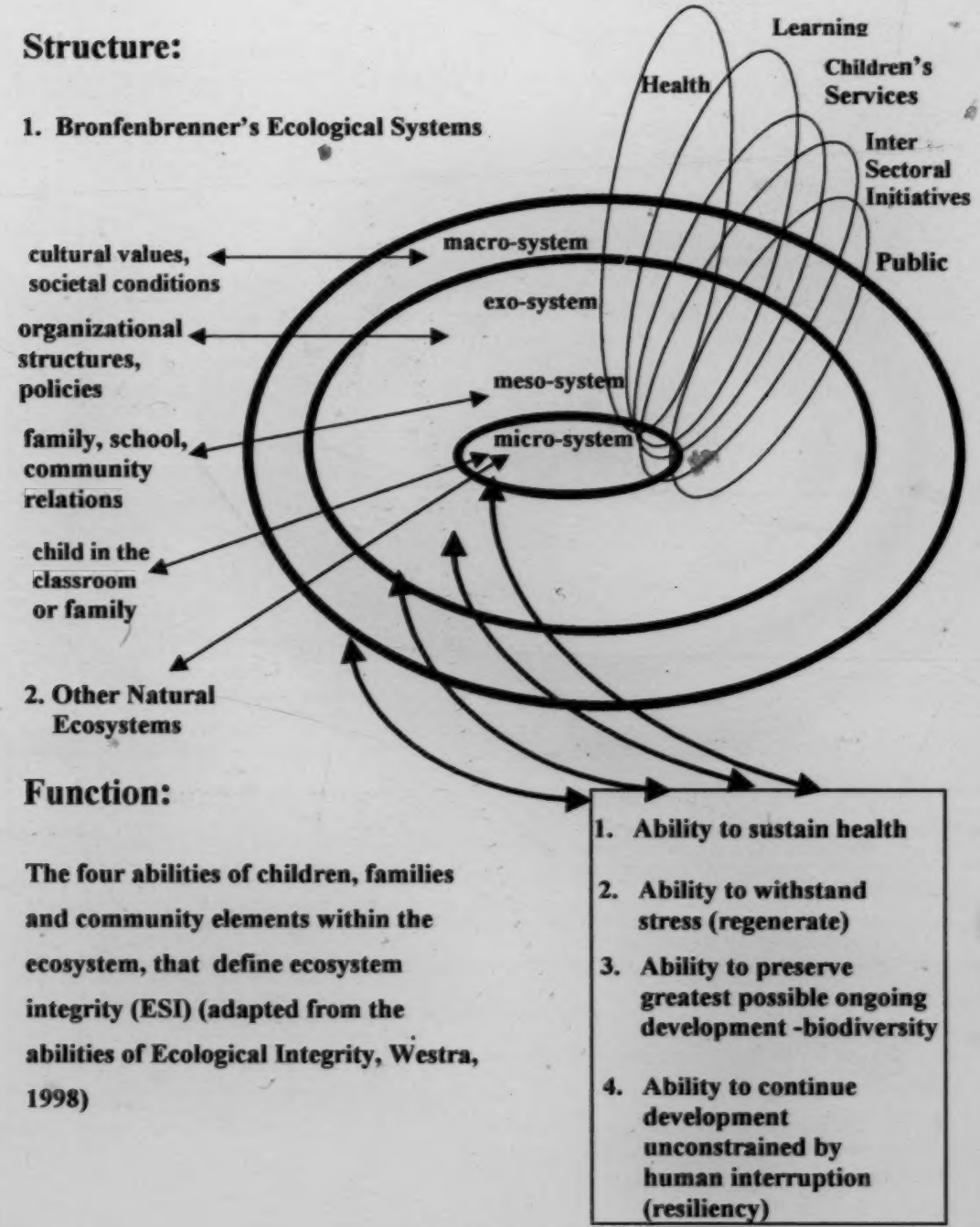
descriptions of essential linkage goals of maintaining health; reduced stress for children, families, and community institutions; the greatest possible ongoing development; and the ability to cope with the negative outcomes in children and families caused by interruption in the human systems mirror Westra's (1998) healthy abilities of ecological integrity. The concept of *ecosystem integrity* for childhood is developed from the state of *ecological integrity*. It requires the perspective of human and non-human linkage infrastructure. In the childhood ecosystem, potentially nurturing processes and outcomes interrelate multidimensional layers of matter at the micro-, meso-, exo-, and macro-levels of the ecosystem for children. The effectiveness of this linkage infrastructure affects the ecosystem's abilities.

Figure 3 illustrates the theoretical description of *ecosystem integrity for childhood (ESI)*. It brings together Westra's (1998) philosophy of ecological integrity and Bronfenbrenner's (1979) ecology of human development theory. The ecosystem structures support the abilities of ecosystem integrity within these micro-, meso-, exo-, macro-levels, for healthy childhood. Furthermore, the abilities, as adapted from Westra, give structure to the ecosystems of Bronfenbrenner. These abilities/structures create feedback looping within the ecosystem, functioning to promote healthy childhood (Figures 3 and 4). That is, the wholeness of ecosystem integrity is defined by both the wholeness of human and non-human structures that support healthy childhood, and the healthy abilities in these structures that, in turn, contribute to structural wholeness.

Pattern: Focusing healthy childhood community linkage infrastructure toward the four healthy abilities of ecosystem integrity adapted from (Westra, 1998)

The abilities that M described as needed in herself and her community to achieve health matched Westra's (1998) abilities. Community institutions—for example, schools, early childhood centres, child health areas, government sectors, and public participatory structures—require healthy linkage abilities reflecting human organizational and cultural elements to work along with the natural, environmental parts of the ecosystem for the child and the child's advocates to link community infrastructure. Receptive, inclusive societies sustain the healthy abilities of children, formal and informal institutions, and communities by directing community linkage goals to these abilities. This is especially

Figure 3. Ecosystem integrity for healthy childhood, extended from Ecological Integrity


Structure:
1. Bronfenbrenner's Ecological Systems
Learning
Children's Services
Health
Inter Sectoral Initiatives
Public
macro-system
exo-system
meso-system
micro-system
cultural values, societal conditions
organizational structures, policies
family, school, community relations
child in the classroom or family
2. Other Natural Ecosystems
Function:
The four abilities of children, families and community elements within the ecosystem, that define ecosystem integrity (ESI) (adapted from the abilities of Ecological Integrity, Westra, 1998)
1. Ability to sustain health
2. Ability to withstand stress (regenerate)
3. Ability to preserve greatest possible ongoing development -biodiversity
4. Ability to continue development unconstrained by human interruption (resiliency)

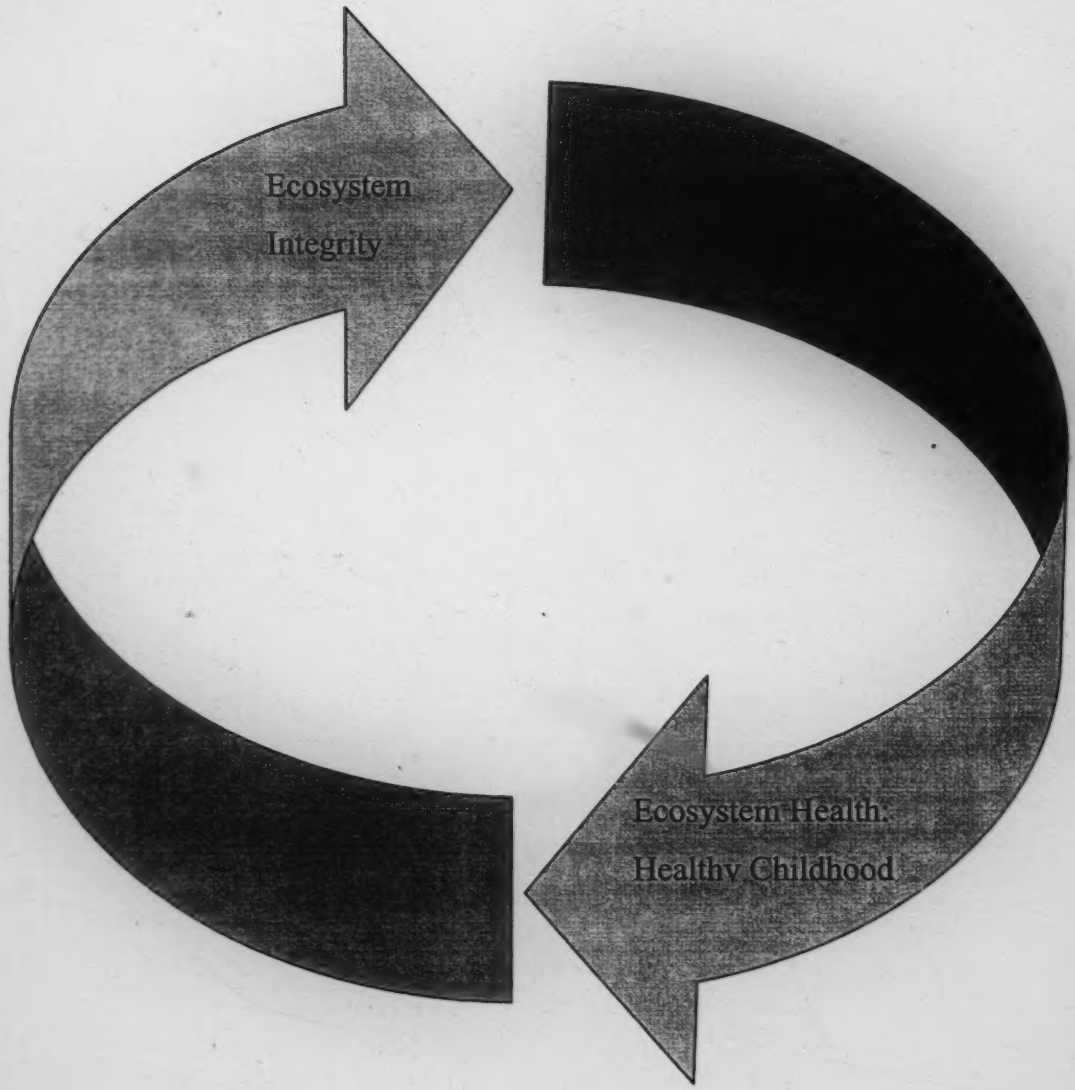


Figure 4. Feedback of ecosystem integrity (ESI) and ecosystem health for childhood. These have implications for structures and abilities of children, families, and communities.

important because there was "most probably some correlation between social function and social stability of a family, and biological severity of disease" (physician A). Tipper and Avard 's (1999) description of the healthy child also depicted Westra's abilities: "develop optimal physical well being, learning readiness, secure attachments and identity, social engagement and competence, and smart risk taking" (p. 9). To develop incentive for purposeful linkage practices, it is important to recognize and support these healthy abilities as successful linkage outcome goals at the child, family, and community levels.

Pattern: Building leverage into healthy childhood linkage infrastructure

The creation of effective linkage patterning in an ecological system includes structures that are "leveraged linkers." Examples from those found in this case study are listed in Appendix D. "Leveraged linkers" operationalize mechanisms to catalyze effort toward positive linkage for childhood among community areas that naturally tend to focus on their own goals. They bring different areas and levels of support for the child and family, as structures that accommodate the polycentric dynamics necessary for healthy childhood.

Leveraged structures that encourage flexibility and the ability to reach all levels of the ecosystems of children are vital, according to the study participants. Networks, themselves, need macro-scale leveraged linkers. According to the government representative, "How you structure yourself to provide that human knowledge, contact, skills, and motivation is challenging." Study participants indicated that a macro-scale leveraged structure is needed for sharing knowledge about childhood. Another example was described by the government representative as a "child, family, community research centre, a cross-specialty research centre" needed for community-based research in Alberta. Bringing networks together at macro-scale leveraged linkers such as the Community-University Partnership for Children, Youth, and Families (CUP), or through large funded government initiatives for childhood, has a further exponential and synergistic effect to integrate energy and effort for childhood. Other leveraged networks currently working in Alberta, not included in study documents, are the Alberta Coalition for Healthy School Communities and the Linkages group in Region 10 that has brought

together boards with responsibilities to children. Leveraged linking is an example of practice that supports structural wholeness in ecosystem integrity for childhood.

Pattern: Wrapping linkage structures around formal and informal institutions

Parents want a "wrap-around service" (government representative). Wrapped linkers are mechanisms at the boundary interface of institutions that interrelate public/community participation with institutional and bureaucratic structure. In this case study, the child and family are seen as informal institutions, whereas institutions such as hospitals, schools, and policy sectors are formal institutions.

Wrapped linkers negotiate institutional boundaries, advocate need, determine priorities, plan strategy, and assess outcomes. The school community team, advocated by M's principal, is an example of such a mechanism of "institutional wrap." It resembles the "action team" (Marx & Wooley, 1998) needed to implement the comprehensive school health approach. The structures of institutional wrap sustain interrelation of critical boundary interfaces to create knowledge about each other's intricacies, strengths, weaknesses, greater efficiency, and skill in covering gaps. They are critical linkage structures for all ecosystem levels.

Pattern: Provision of multiple points of equitable access to community support

Flexible continuums of care with multiple points of access prevent community system "gridlock" and "mismatch," where the systems could inflict further damage or "re-victimization" (child advocate) to the child or family, or the community. With gridlock there is no room to move to appropriate solutions. It prevents the ability to "do it right the first time, . . . to prevent damage" (child advocate). According to study data, provision of multiple points of equitable access requires the linkage goals of guarding against underestimation of needs, provision of tangible and intangible supports, and constancy of support. It also requires recognition of the longer periods of adolescence in some children. Income level of the family, institution, or community does not negate the need for multiple points of access to linkage, because all children, families, and communities need the opportunity and positive outcomes from their ecosystem interrelationships (Epstein, 1995; Weiss et al., 1993).

Pattern: Funding human resources infrastructure

An inability to negotiate boundary interface is a frequent dynamic cited by study participants. Sufficient human resources with linkage expertise are essential. Such investment would prevent under-identification of need, mistrust, excessive workload, lack of knowledge, and unproductive effort. Without sufficient human resources positions (both paid and volunteer), a false sense of security and/or an increased perception of vulnerability can develop in parents, children and youth, caregivers, or communities. Frustration and stress are the outcome. On the other hand, when parents and/or professionals participate in good faith in community institutions, their work may be misinterpreted or trivialized. This may lead to "revictimization" by the systems (child advocate). Sufficient human resources to meet needs and healthy development with linkage expertise are needed to address these dynamics.

Pattern: Making accountable and rewarding collaborative linkage practice

It is critical that an organizational culture be developed in which the sectors with responsibility for childhood "see themselves as part of one service system as opposed to separate service systems—a service system for children" (child advocate). Study participants described joint reward and accountability mechanisms such as encouraging multiple voices rather than exclusion of them, accommodating a multitude of perspectives within formal and informal processes, rewarding collaboration in job evaluations, implementing payment for value and other concrete reward systems, and using interdisciplinary expertise for children, especially in areas of greatest vulnerability. Shonkoff and Phillips (2000) argued that linkage barriers become insurmountable without a "locus of responsibility . . . and that effective policies require aggregate responsibility" (p. 414).

Joint accountability, joint funding strategies, and creative reward for collaborative linkage practice are important institutional linkage mechanisms that support a continuum of professional, institutional, and community improvement and develop the public valuing of such investments. Redefining organizational and community time frames for collaborative linkage processing within systems is critical. Public program support for long-term continuous learning and long-term data management in this regard is also key

(Weiss, 2001). According to local experts (Junek & Thompson et al., 2000), self-regulating service delivery systems use the feedback mechanism of a continuous process of decisions, actions, outcomes, measures, evaluation, feedback, incentives, and rewards. Therefore also striving for self-regulating ability in inter-sectoral collaborative systems is an important linkage goal.

Pattern: Creating knowledge networks

Equitable access to knowledge-sharing networks and the use of multiple modes of knowledge sharing are vital for accessibility to linked support for childhood systematically provided "from birth" (parent). This pattern was corroborated by all study participants. In this case study knowledge often exists, but it has been difficult for the participants to find. Documents also supported the need to ensure a "locus of responsibility" for knowledge sharing (Mustard & McCain, 1999) to address services, supports, policy, and advocacy. Knowledge networks have the potential to reduce the research to practice gap and develop advocacy across the systems to preserve self-renewal of professionals, the public, organizational structures, and systems. Universities and other learning institutions are required for knowledge sharing to develop best possible outcomes for childhood (Lawson & Hooper-Brier, 1993). Without purposeful linkage of knowledge, the information explosion in societies cannot be usefully implemented on behalf of childhood.

Boundary Activities

Linkage mechanisms function at the boundaries of formal and informal institutions and ecosystem subsystems including sectors. In this case study 12 linkage patterns were found to support linking boundary activity.

Pattern: Attending to interdependencies in the ecosystem

Linkage practice in human and non-human contexts reflects the fundamental need to function in interdependent groups. In the case study, attunement to interdependencies helps to mitigate "that trade-off between local innovation and flexibility, responsiveness, and reasonable comparability and standards, best practices" (government representative).

Bronfenbrenner's (1979) ecological model helps to operationalize this notion for childhood.

Pattern: Balancing individual and group rights

Linkages that balance the rights of individuals and groups help to navigate the complexities of childhood and mitigate the rights and responsibilities within families and communities as the foundations of societies. A balance of the individual and group rights between the child, the family, and the community is required to share power, strive for equity, and enable proactive engagement. Reduction of the effects of stress and vulnerability are the linkage goals. All study participants advocated key linkage structures at points of vulnerability and transition within the ecosystem. The child advocate stated that without standards of practice for Child Welfare within Aboriginal reserves, "Aboriginal children on reserve often don't get the kind of child protection services that they should get as Albertans." This boundary activity helps to maintain a balancing of perspectives, strengths, or vulnerabilities in the ecosystem.

Pattern: Strategically strengthening selected ecosystem elements

Strengthening the linkage abilities of the individual, organization, or region can prevent the insularity of a child, family, region, or site. For example, physician B emphasized the importance of rural regions being connected to larger centres to share expertise. Effective linkage infrastructure needs to be available and flexible enough to support individual strengths in the micro-, meso-, exo-, and macro-ecosystem levels. Clearly, effective linkage infrastructure for childhood works beyond geography, specific community or political aggregates. This linkage activity helps to maintain identities, yet benefit from the influences of globalization on community systems.

Pattern: Creating strong linkage between primary (prevention), secondary (ambulatory care), tertiary (crisis) health care levels for a balanced strategy of preventive and crisis driven linkage

Achieving healthy development of children that is supported by the tertiary, secondary, and primary levels of health care support is influenced by linkage outcomes at other ecosystem levels. This interdependence necessitates shared responsibility for a

linked continuum of inter-sectoral planning, practice, and achievement of health outcomes. According to the study, clarity about roles and responsibility become critical for M and for all children. It was often asked, How will coordination be achieved? Who will speak for needs? Who will sustain linkage support with the parent? For example, it is evident in the study that to achieve sustainability of new or proposed government and institutional initiatives for children (Region 10 ambulatory care plan; ESHIP) would require long-term linkage practice for sustainable health of the whole school community. This can be achieved only through both preventive and crisis-driven linkages created at the community level, according to regional inter-sectoral community care plans for childhood, to build sustainable relationships over time.

Pattern: Building "receptivity" (child advocate) into community systems

Negotiating the linkage at boundary interfaces for professionals, organizational systems, and parents/public is cultivated by "receptivity" (child advocate) at the boundary interface. "Receptivity" prevents "revictimization" (child advocate) by the systems to children, families, professionals, institutions, and other community systems. Validation of needs is a key element to successful linkage practice. It respects agency as a vital linkage dynamic to give voice to concerns, efficiencies, and effectiveness (Crowson & Boyd, 1996b). It counteracts begging for support, fear, and feelings of vulnerability. M's parent and other participants found that often when families, institutions, or communities are most vulnerable and least able, more is expected from them because of lack of community or service-system support, often increasing their stress. The quality of "receptivity" facilitates the linkage of boundary interface both within the system and extending this ability outside to other systems. It could negotiate re-entry into a system.

Effective linkage mechanisms have principles of linkage that are relationship based; involve trust and integrity, value learning, creativity, and understanding of collaborative outcomes; and are accountable. These mechanisms bring about inclusiveness rather than exclusion to increase linkage efficiency.

Pattern: Developing synergy through boundary activity

Synergy from linkage that creates depth to the support to child, family, institution, or community is created by the nature of synergistic activity using the boundary

interfaces of linkage structures. In the study, M's teacher felt that she would be far more effective in the classroom with more information about the implications of M's condition from the health sector, so that she could keep a safe environment for M and help other students support M and learn from her. All involved would benefit. The meeting of boundary interfaces in highly effective ways can maximize effort toward the goals for childhood. Boundary permeability, overlap, or efficiency may be negotiated, but this dynamic involves more. Energy flow could be magnified exponentially using these boundaries. Effective collaborations become exponentially successful over time, though initial collaborative processes take much time and effort. Building such strategic, purposeful relationships reduces fear and encourages efficiency, strengths, and positive outcomes within community systems. Without this dynamic, working together may become too onerous. This pattern helps the benefits of linkage to outweigh the risks.

Pattern: Facilitating the process of linkage inside the subsystem and outside the subsystem

Two important areas of linkage facilitation are needed within community subsystems: inside facilitation of intra-system and inter-system linkage, and linkage facilitation outside the subsystem that brings diverse areas together to interrelate. Inside/outside facilitation creates broader community linkage ability as well as more specific linkage ability within a sector. The Alberta Children's Initiative has set a more integrated inter-sectoral government focus for children. In the study documents in the learning sector, Alberta Initiative for School Improvement (AISI) was planned by education stakeholders only. Student Health Initiative Project (SHIP) was planned using a cross-sectoral context. There currently is no linkage between SHIP and AISI community practices. Sharing linkage practices will be required to carry out the goals of each of these initiatives. In another study example, the Office of the Children's Advocate saw the need to assist other inter-sectoral systems to develop their own advocacy structures. Specific positions that create linkage facilitation appear to be vital within each system. In turn, the interlinking of these structures is required for maximum effect. This pattern creates greater potential for knowledge sharing about the particularities, possibilities, and opportunities of linkage.

Pattern: Use of leveraged processes at boundary interfaces in schools and early childhood centres

There are at least four large boundary interfaces indicated in the study and supported by Crowson and Boyd (1993) that are essential locations for linkage activity for schools and early childhood centres. They are supported by the following areas found in this case study: the processes that address the specific needs of children and families, including those with more complex health/learning needs; the community and bureaucratic processes within the learning sector that are specific to teaching and learning; the processes that promote an ongoing healthy school community or family; and the processes of public participation and wider community involvement. Processes at these interfaces that use interdisciplinary service teams, a healthy school community team, and the school council working toward the elements of comprehensive school health (Marx & Wooley, 1998) are critical to bring government and community initiatives to each school environment and sustain them in meaningful ways for the child and community. The goals set for government initiatives such as Safe and Caring Schools, SHIP, and children's mental health initiative, and advocated in the Province of Alberta's Special Needs Review, require strategic use of these interfaces by structures to increase efficiencies and develop sustainability of healthy environments for children, families, and communities at schools or early childhood areas,

The nature of the institution to educate children must be reconceived (Egan, 2001). Schools have had a great deal of ambivalence about their institutional roles that ranges from socializing children (character), academics, and child development. Egan stated that schools could not carry out these three different roles and still function by themselves because the more they do for society, the harder it is to accomplish academic goals. This study found that inter-sectoral linkages must be implemented at schools and early childhood centres to carry out these multiple roles effectively.

Pattern: Recognizing the key boundary of the interlinked concept of health/learning

The health-learning interrelationship requires "teams of people looking after kids . . . using flexible funding" rather than "separate teams and inflexible funding within the sectors" (principal). Use of strategies for inter-sectoral and community primary,

secondary, and tertiary level linkage with the school or early childhood centre are essential to "a full knowledge" (parent) about the linked concepts of health and learning and their implications for the child, family, and community. The concepts of health and learning are linked concepts (Levine, 2000; Mayall et al., 1996). The child advocate stated that "planning for transition to the institution of the school should be considered with the same emphasis as transition to the institution of the home and family." In linkage structures, school-linked services could not be dominated by any one institution, either the school or health or social services areas (Behrman, 1992). He stated that school institutions could not dominate or seek to control the planning or governance of services but must become characterized by shared power that also includes parents. These linkage goals serve to increase identification of needs in childhood, societal understanding of health/learning contexts, and their outcomes.

Pattern: Recognizing the key boundary of early childhood and school linkage

The linkage between early childhood areas and schools is an essential element in the community continuums of support for children with complex needs and for all children, to provide continuity of nurturing environments. Linkage practices for health/learning are critical in both of these areas. Study participants agreed that "much more should be done for early childhood" (teacher A). Early childhood support is a current linkage goal for the Alberta government (government representative). Shonkoff and Phillips (2000) cited major barriers for early childhood in their review of studies as lack of quality and choice in early childhood care, poverty, lack of rigorous evaluations of program implementations, lack of documentation of causal relations between interventions and outcomes, and lack of mechanisms of change and of cost/benefit analysis. Early childhood policy is fragmented with confusing points of entry. There is a lack of integrative early childhood structure, and professional development and research practice is geared to program funding rather than the promotion of continuous improvement (Shonkoff & Phillips, 2000). "Comprehensive research programs that integrate efforts to understand development, with efforts to change it, are even more unusual" (p. 403). Barriers cited by study participants verified these conclusions. Early childhood areas and schools have much to learn from each other about their goals and outcomes of linkage.

Pattern: Maintaining cohesion in community systems

Many of the participants agreed with the principal, who stated that provincial government departments often work "at cross-purposes rather than together" in their policy. The child advocate reiterated that with regional governance and school site-based management, creative linkage and standards are needed to complement the effects of decentralization. They are often missing. Cohesion rather than coherence is the prime linkage goal and is characteristic of successful linkage ability (Capper, 1994). Cohesion enables the "bending and flexing" together of community linkage infrastructure to increase the chances of interrelation and of broader successful linkage outcomes. It creates increased opportunity for relationship development, a valuing of each other, and a greater knowing of each other's strengths and weaknesses. It develops flexibility, the ability to perform more intricate work, and the comprehensive ability to meet needs and cover gaps.

Pattern: An ecosystems perspective for community-based research

Site-based research in schools and early childhood areas in Alberta that emphasizes healthy school communities is greatly needed, according to the government representative. Community-based research is "a collaboration between community groups, policy makers and researchers for the purpose of creating new knowledge about a practical community issue in order to bring about change. . . . It is collaborative, participatory, empowering, systematic and transformative" (Hills, 2001, PowerPoint presentation). Knowledge development and sharing linkage practices in community systems require community-based research with an ecosystems perspective to pursue knowledge at three levels of interrelationships: at the level of the child and family, at the level of organizational and community interrelationships, and at the synthesis of these two levels. This approach has the potential to link individual health with community health at molecular biological levels (Shonkoff & Phillips, 2000). Ecological complexity requires multiple modes of research to understand ecological structures, processes, and outcomes from interdisciplinary and community perspectives.

Outcome Goals

Effective linkage outcomes give healthy abilities to children, families, institutions, and communities. Six patterns from the study are described. Each pattern supports all of the four healthy ecosystem abilities adapted from Westra's abilities of EI.

Pattern: Child, institutional, and community health-centred goals, including molecular biological outcomes

In the study, physician A and physician B highlighted the importance of the abilities of families and communities to make value judgements ethically and learn "how to live well" (physician A). Physician A stated that when families are well linked with support, they experience a satisfaction that they are successful in preserving their own child and family health. Both teachers and the principal stated that the institutional ability to share knowledge through linkage brings community support to curriculum demands; positive, rewarding relationships between professionals, parents, teachers, and child/youth; a shared load among disciplines to support the student; and reduced stress for all. In healthy communities successful linkage brings a validation of needs, proactive community abilities to access support, and an appreciation of the community whole (parent). Systems theory helped convert "biological science to human organization" (Green, 1996, p. 275) to contribute to ecosystem health and productive use of research.

Pattern: A dynamic response to the child's environment through portability and permeability of boundaries

Community systems require the ability to bring a portable web of linked support to the environments of the child to negotiate entry and re-entry of the child and family into the eco-subsystems. Sustained linkage remains the desired outcome for all study participants, rather than "hit and miss" or "by accident" (parent). Many barriers described by the study participants showed system "gridlock" (child advocate). Study evidence indicates that linkages that were dynamic, flexible, efficient, and resilient, enabled the ability of expertise to move across organizational and community boundaries, and reached the child's point of environment were vital characteristics of linkage infrastructure to accommodate the child's context. According to study participants and documents, shared power, single point of entry, community level negotiation, and

supportive structure and process with transition from one institution to another were elements of this pattern.

The Precautionary Principle is an "agent of change" (Westra, 1998, p. 13) required for policy reflecting ecological integrity, to protect environments even before scientific evidence becomes available. The ability of linkage infrastructure to protect the child's inherent vulnerability through permeability of boundaries to reach the child's micro-environments from many areas in the ecosystem is vital to achieve ecosystem linkage infrastructure reflecting an adaptation of this principle for childhood.

Pattern: Inclusion and support of public participation

Public participation structures for participatory, advocacy, and/or democratic process, such as intra-sectoral and cross-sectoral positions or councils, are critical for community interrelationships. Many parents do not have enough knowledge about school councils (M's parent). As suggested by Coyne (2001), not everyone has the skills to express public "voice"; and with unsatisfactory conditions, "institutional exit" may become a more immediate solution, weakening public community systems.

All study participants indicated that public participation should not be seen as linkage, that is, an add-on to or separate from the service process. Service-system planning needs to start with parents (parent, principal, physician A); and parents, in order to give support, need to be supported in their advocacy role by the service systems. This requires education and inclusion in administrative planning and decision-making processes. In turn, public participation requires understanding and respect for bureaucratic system readying or adjustment. Respecting this linkage dynamic prevents frustration, further "revictimization by the service systems" (child advocate), inefficiency of process, lack of validation of needs, and lack of power sharing. Public participation structures are often not linked to each other. They require sustained intra-sectoral and cross-sectoral linkage processes for maximum outcomes.

Pattern: Achieving collaborative linkage infrastructure

Collaborative linkage "must be more than bridging" (government representative). Collaborative linkage must go beyond the depth of relationship in cooperation, bridging, compromise, or "partnership" to levels of intensity and commitment that sustain larger-

scale positive interrelationships and their outcomes (Hills, 2001). Hills stated, "Collaboration is the creation of a synergistic alliance that honours and utilizes each person's contribution in order to create collective wisdom and collective action" (PowerPoint presentation). Proactive collaborative linkage infrastructure within community systems contributes to the healthy abilities of the child and of ecosystem levels, to reduce collaborative drains on communities and produce a larger scale of linkage with maximum outcomes.

Collaboration, according to study participants, requires linkage mechanisms that contribute to planning, education, communication systems, budgeting, compensation, community relations, knowledge sharing, and inclusive governance. Rabin (2001) brought psychology into economics by using mathematical formulas to "incorporate into economic theory, the human response to fairness and reciprocity. People behave toward others as they believe others are behaving toward them, even if such behaviour does not maximize income or well-being" (B10). Therefore, such concrete implications of the role of fairness enters into markets such as labour markets and should be considered factors in models for collaborative relations in community linkage. Outcomes from these mechanisms include purposeful structuring of linkage, cohesion, synergy of practice, knowledge of strengths and weaknesses, efficiency of linkage, ability to navigate complex volumes of information, and the revitalization of knowledge. These serve to prevent gaps and help to cope with differing parental or institutional abilities and with vulnerabilities in the child, family, institutions, or ecosystem levels to safeguard the child.

Pattern: Preserving a culture of childhood

Regional "community action plans" (teacher A) were identified as essential structures for children, families, and communities to encourage a strong sustainable culture of childhood. A culture of childhood in societies is implemented through a conscious effort to link purposefully across the ecosystem using these patterns of linkage as a conduit to promote the healthy abilities of childhood. These linkage patterns reduce the knowledge to practice gap and create political will and societal knowledge for a strong culture of childhood. They create the critical ingredients of shared expertise, shared leadership, flattening of hierarchies, the dedication of time, knowledge development, learning organization principles, multiple modes of communication through

leveraged channels, and policy development supportive of linkage infrastructure. Strong communication structures prevent discord, negative competition, and lack of sustainability. All citizens benefit when they see themselves as change agents with strong advocacy roles (Peters, 1995). The implementation of collaborative linkage infrastructure helps to develop supportive webs using community practices for complex ecosystem relationships to support the complexities of childhood.

Pattern: Sustaining the indicators of ecosystem integrity and ecosystem health for childhood because ecosystem integrity, as an extension of ecological integrity, is a determinant of health and health is a determinant of ecosystem integrity

Linkage descriptions in the charts and document syntheses give evidence that the successful linkage structures, processes, and outcomes of human and non-human linkages for M and for all children have met the linkage goals characterized by the healthy abilities adapted from Westra (1998). Therefore, these linkage structures and linkage abilities become indicators of ecosystem integrity for childhood. They are also indicators of the healthy abilities that define ecosystem integrity in the child's ecosystem. For example, the presence of interdisciplinary service teams as a linkage structure accessing the school was an indicator that health/learning linkage abilities were occurring. The presence of these productive human and non-human interrelationships describes ecosystem integrity itself, which sustains children, families, and communities within the ecosystem. These interrelationships, as linkage infrastructure, are indicators of ecosystem integrity for childhood.

In summary, human and non-human linkage structures, processes, and positive outcomes that support the healthy abilities of children, institutions, and communities, when implemented, form patterns of linkage infrastructure that are indicators of successful ecosystem linkage abilities and of ecosystem integrity that address the vulnerability of childhood. Alberta's Primary Health Care Report (HowardResearch, 2000) stated, "If initiatives actively engage in an interrelationship with their external environments to fulfill their needs and exploit opportunities, they move toward sustainability" (p. 87). Sustainability of ecosystem integrity depends on the recognition and sustaining of these patterns of linkages as indicators of matter forming ecosystem integrity and ecosystem health for childhood in the biosphere. According to this study,

these interrelationships form indicators of ecosystem integrity for childhood and should be added to other indicators of ecological integrity (EI) in natural systems, for a more complete view of ecosystem integrity for childhood. Figures 5, 6, and 7 illustrate linkage infrastructure for childhood using the Alberta context and study recommendations.

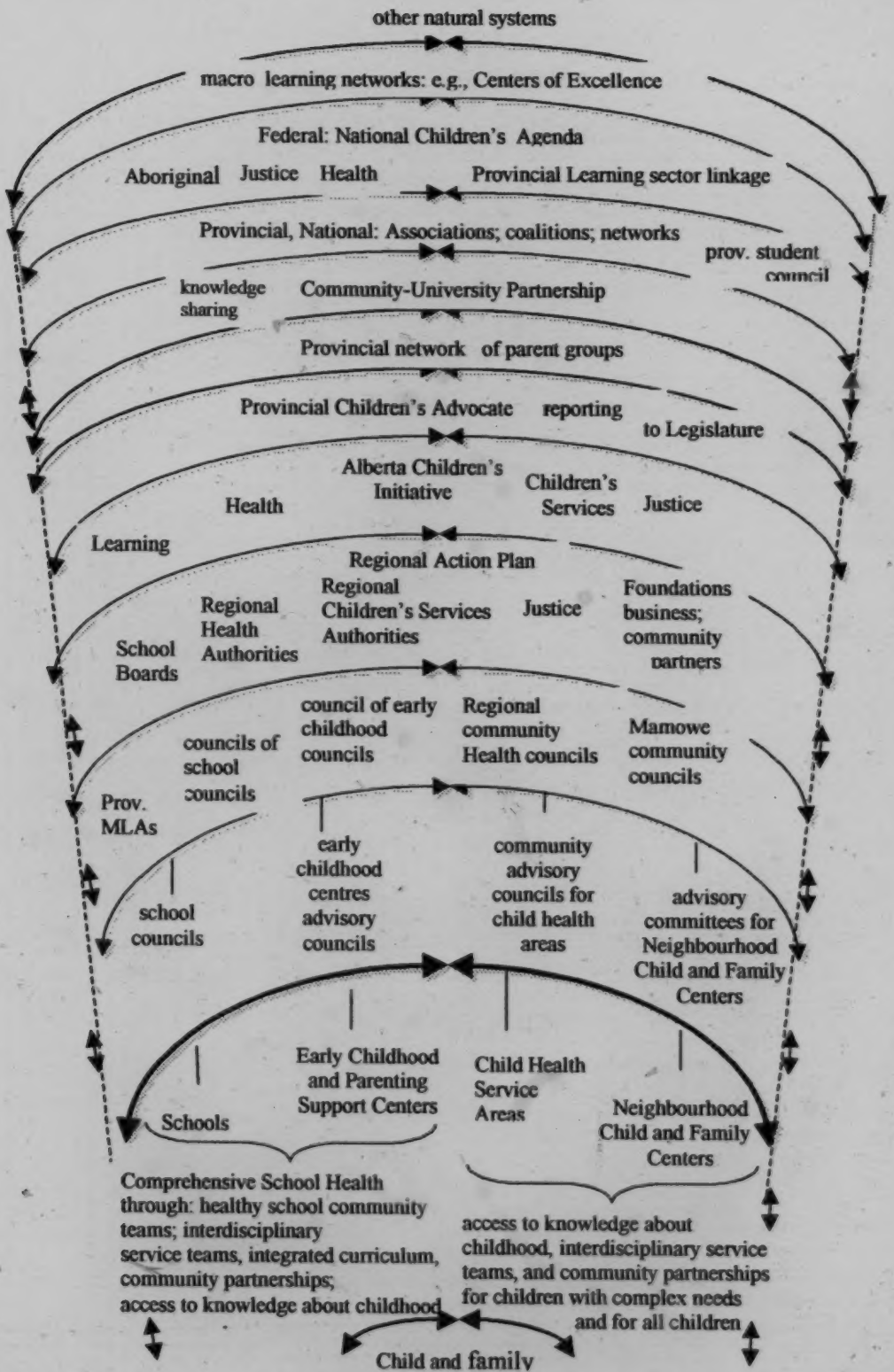

other natural systems
macro learning networks: e.g., Centers of Excellence
Federal: National Children's Agenda
Aboriginal
Justice
Health
Provincial Learning sector linkage
Provincial, National: Associations; coalitions; networks
prov. student council
knowledge sharing
Community-University Partnership
Provincial network of parent groups
Provincial Children's Advocate
reporting to Legislature
Alberta Children's Initiative
Health
Children's Services
Justice
Learning
Regional Action Plan
Regional Children's Services Authorities
Regional Health Authorities
School Boards
Justice
Foundations business; community partners
council of early childhood councils
Regional community Health councils
Mamowe community councils
councils of school councils
Prov. MLAs
early childhood centres advisory councils
community advisory councils for child health areas
advisory committees for Neighbourhood Child and Family Centers
school councils
Early Childhood and Parenting Support Centers
Child Health Service Areas
Schools
Neighbourhood Child and Family Centers
Comprehensive School Health through: healthy school community teams; interdisciplinary service teams, integrated curriculum, community partnerships; access to knowledge about childhood
access to knowledge about childhood, interdisciplinary service teams, and community partnerships for children with complex needs and for all children
Child and family

Figure 5. Linkage infrastructure.

Figure 6. Health/learning linkage infrastructure to direct to healthy abilities (adapted from Westra, 1998) in the child, family, community.

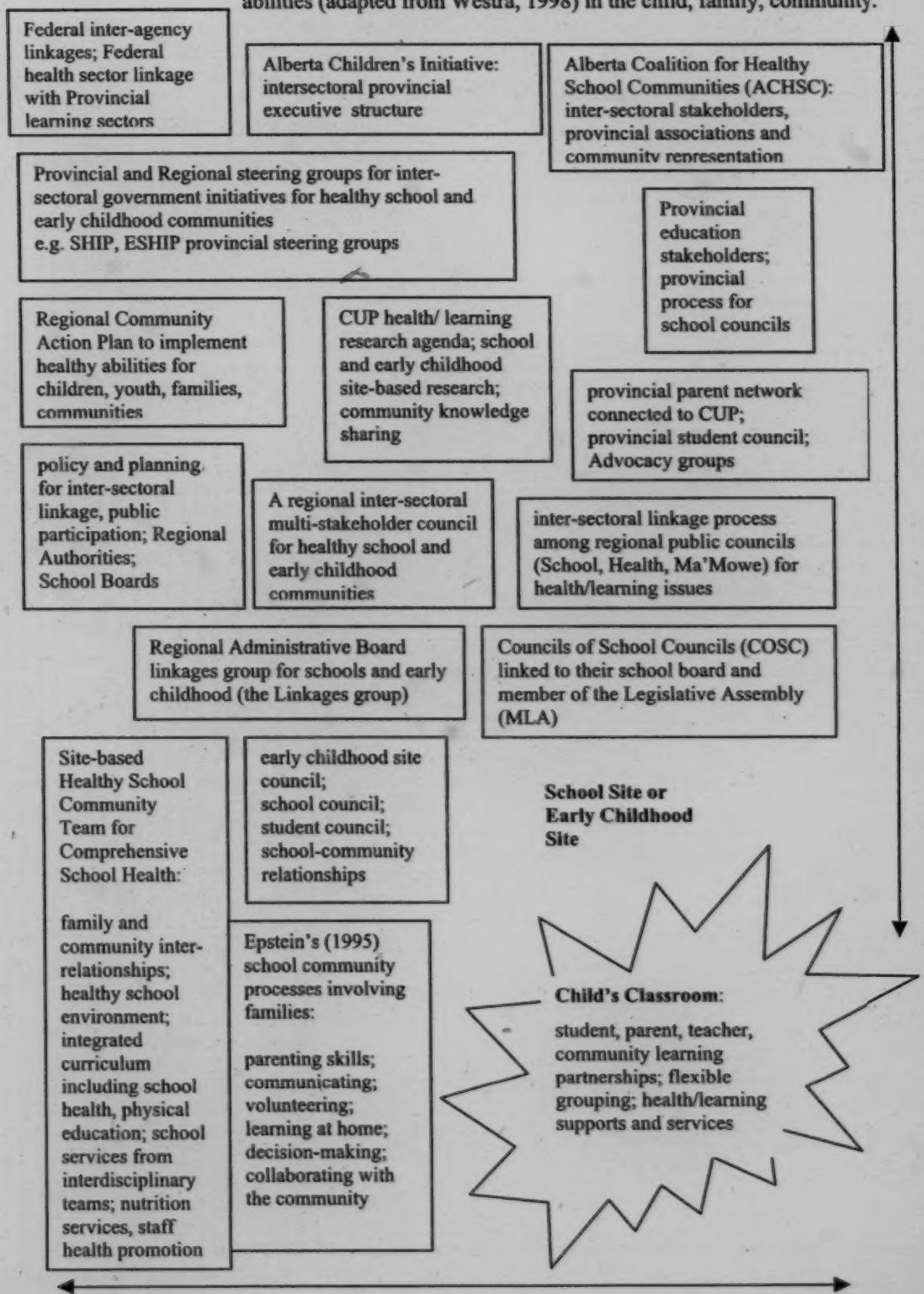
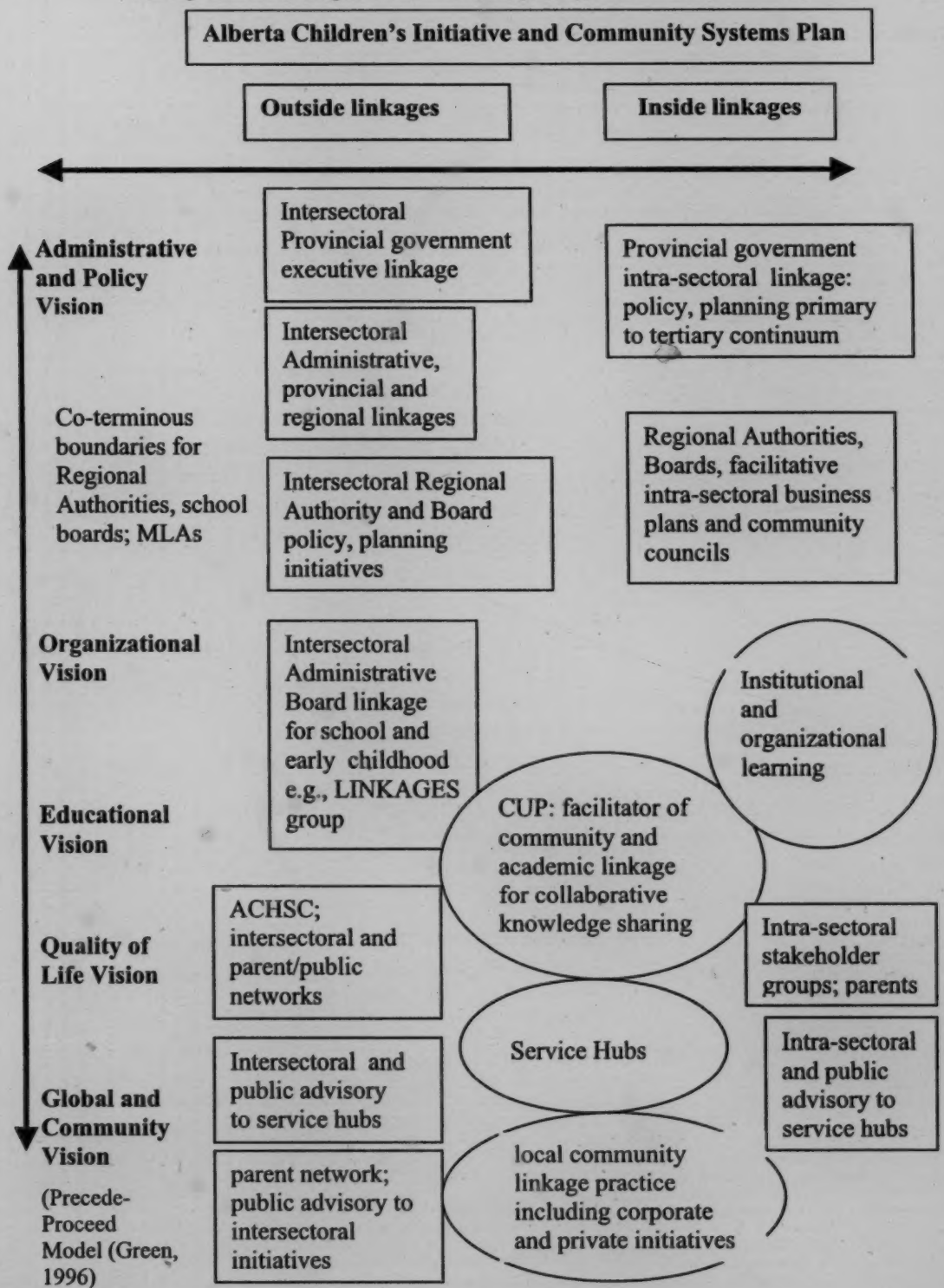

Federal inter-agency linkages; Federal health sector linkage with Provincial learning sectors
Alberta Children's Initiative: intersectoral provincial executive structure
Alberta Coalition for Healthy School Communities (ACHSC): inter-sectoral stakeholders, provincial associations and community representation
Provincial and Regional steering groups for inter-sectoral government initiatives for healthy school and early childhood communities e.g. SHIP, ESHIP provincial steering groups
Provincial education stakeholders; provincial process for school councils
Regional Community Action Plan to implement healthy abilities for children, youth, families, communities
CUP health/ learning research agenda; school and early childhood site-based research; community knowledge sharing
provincial parent network connected to CUP; provincial student council; Advocacy groups
policy and planning for inter-sectoral linkage, public participation; Regional Authorities; School Boards
A regional inter-sectoral multi-stakeholder council for healthy school and early childhood communities
inter-sectoral linkage process among regional public councils (School, Health, Ma'Mowe) for health/learning issues
Regional Administrative Board linkages group for schools and early childhood (the Linkages group)
Councils of School Councils (COSC) linked to their school board and member of the Legislative Assembly (MLA)
Site-based Healthy School Community Team for Comprehensive School Health:
family and community inter-relationships; healthy school environment; integrated curriculum including school health, physical education; school services from interdisciplinary teams; nutrition services, staff health promotion
early childhood site council; school council; student council; school-community relationships
School Site or Early Childhood Site
Epstein's (1995) school community processes involving families:
parenting skills; communicating; volunteering; learning at home; decision-making; collaborating with the community
Child's Classroom:
student, parent, teacher, community learning partnerships; flexible grouping; health/learning supports and services

Figure 7. An example of inside/outside linkages for childhood to direct to healthy abilities, adapted from Westra (1998), in children, families,


Alberta Children's Initiative and Community Systems Plan
Outside linkages
Inside linkages
Administrative and Policy Vision
Intersectoral Provincial government executive linkage
Provincial government intra-sectoral linkage: policy, planning primary to tertiary continuum
Intersectoral Administrative, provincial and regional linkages
Co-terminous boundaries for Regional Authorities, school boards; MLAs
Intersectoral Regional Authority and Board policy, planning initiatives
Regional Authorities, Boards, facilitative intra-sectoral business plans and community councils
Organizational Vision
Intersectoral Administrative Board linkage for school and early childhood e.g., LINKAGES group
Institutional and organizational learning
Educational Vision
CUP: facilitator of community and academic linkage for collaborative knowledge sharing
Quality of Life Vision
ACHSC; intersectoral and parent/public networks
Intra-sectoral stakeholder groups; parents
Service Hubs
Intersectoral and public advisory to service hubs
Intra-sectoral and public advisory to service hubs
Global and Community Vision
local community linkage practice including corporate and private initiatives
parent network; public advisory to intersectoral initiatives
(Precede-Proceed Model (Green, 1996)

CHAPTER VI

DISCUSSION

Three categories of linkage patterns arose from the data in this study: ecosystem structures, boundary activities, and linkage outcome goals (Table 3). The linkage patterns described within these categories work together to form linkage infrastructure. This linkage infrastructure becomes part of ecosystem integrity for childhood developed from ecological integrity (EI; Figure 3). The linkage infrastructure is crucial because it is a conduit that creates and conveys healthy abilities in children, families, and communities as adapted from Westra (1998). The healthy abilities that are created and/or shared in children, families, and communities, in turn, feed back into the state of linkage infrastructure itself (ecosystem integrity), and may change that structure (Figures 3 and 4). In this discussion I would like to emphasize three important aspects of the findings. First, the outcome goal patterns are examples of the four healthy abilities of ecosystem integrity, adapted from Westra's abilities defining ecological integrity. Second, there is a need for the concept of ecosystem integrity with human inclusion, to be an extension from and to develop from the philosophy of ecological integrity (EI). Third, a practical delineation of collaborative ecosystem linkage infrastructure arose from the study.

In the first emphasis, the outcome goal patterns of linkage are closely related to and/or are examples of Westra's (1998) four healthy abilities that define ecological integrity. The patterns of linkage according to the categories of ecosystem structures, boundary activities, and linkage outcome goals that support healthy childhood (Table 3) constitute a beginning linkage theory of ecosystem integrity for healthy childhood. In the first category of linkage patterns, ecosystem structures, according to eight patterns, were described. Some structures could be purposefully formed in societies within the ecosystems. In the second category, boundary activities of linkage structures, according to 12 patterns, are linkage strategies that could bring effective, streamlined collaboration and leverage of linkage processes. These processes direct linkage structures toward healthy abilities. In the third category, the linkage outcome goals arising from the study data were healthy abilities that were essential to preserve health in children, families, and communities. Within these linkage outcome goals, six patterns were identified in data

analysis: child, institutional, and community health-centred goals; dynamic response to the child's environment; inclusion and support of public participation; achieving collaborative community linkage infrastructure; preserving a culture of childhood; and sustaining the indicators of ecosystem integrity and ecosystem health for childhood. Each linkage outcome pattern provides a contribution to all four of the abilities adapted from Westra's healthy abilities of EI: the ability to sustain health and wellness, the ability to withstand stress (regenerate), the ability to preserve biodiversity and greatest ongoing development, and the ability to continue development despite human interruption (resiliency).

In the second emphasis, the patterns delineated in the beginning linkage theory for ecosystem integrity for healthy childhood point to the need for human inclusion into the concept of ecosystem integrity and the relevance of developing the concept as an extension of the philosophy of ecological integrity (EI). The importance of human inclusion is illustrated in the study data and in the current literature, which has detailed critical issues for childhood, such as the nature-nurture debate; self integration; the importance of wholeness in children, families, and communities and how wholeness is delineated; the feedback looping of structure and function; vulnerability and prevention of under-identification of needs; the importance of research to determine the linkages between community environments and molecular biological outcomes; and the need for similar linkage outcomes for children, families, and community environments within the ecosystem.

In the third emphasis, linkage infrastructure that arose from the data confirms the need for a systems approach to the organizing of community response for the societal goal of healthy childhood. Practical delineation of linkage infrastructure is undertaken according to the study data and the literature to describe the collaborative community linkage infrastructure required in community systems to achieve ecosystem integrity for childhood. These practical linkages within the patterns of linkages described (Table 3) are indicators of ecosystem integrity and ecosystem health in childhood, and a contribution to the last research question (Figures 5, 6, and 7). They illustrate the *naturalistic generalization* of the study. Organizational dynamics within the ecosystem

linkage infrastructure will be addressed, as well as the indications for research and education.

Healthy Abilities in Children and Youth, Families, and Communities

The realities that significantly change social structures around children and youth today are the rapidity of change, changing family structures, increasing diversity and a more global society, the changing role of women, a perception of increased violence, the effects of the global economy on economic and government restructuring, and the increased necessity for lifelong learning (Canadian Institute of Child Health [CICH], 1994). The expanding concept of child health does not merely reflect an absence of disease. It describes the necessity for children to communicate, learn, create, move, play, attach, be safe, and achieve the meeting of their biopsychosocial needs with support from a healthy community.

There are significant conceptual challenges according to study findings in enabling the implementation of a healthy childhood and in developing an understanding of interdisciplinary and community perspectives with clear roles and responsibilities to create supportive community linkage structures as a societal norm. Heinzer (1998) described Bearer's model of the maturing child as the "interacting with physical, biologic and social environments within developmental growth stages. . . . Health is a . . . multi-dimensional as well as a philosophic stance and a shared community life" (p. 9). An integrated perspective about children is vital to clearly understand the complexity of their needs and determine effective ways of meeting them as a community (Driscoll, 1995).

Healthy childhood, a multifaceted concept, is a collaborative community undertaking requiring consideration of the micro-system environment of the child, integrated perspectives in individual interactions and within institutions, government sectors, and community cultures. This study found that the philosophy and framework of ecological integrity (Westra, 1998), as wholeness of structure, defined through the healthy abilities discussed below, is also an important goal for linkage structures, processes, and outcomes across the ecosystem levels of childhood to contribute to the implementation of ecosystem integrity for childhood.

The Ability to Maintain Health and Wellness

Childhood is a unique developmental stage of life that has continuity to adult health but requires different delivery of services because of developmental change, dependency on parents and other adults for assessing and accessing care, and the presence of a differential epidemiology and demographic patterns such as poverty (Forrest, Simpson, & Clancy, 1997). These authors stated that just as health care for children requires parental involvement, many aspects such as education, disease management, navigating systems, and research must incorporate the parent and family perspectives. They advocated widening of the biomedical model to include a multidisciplinary approach and a conceptual basis that is relevant to all children, not just those with a disorder. Teacher A stated:

> I don't think parents and teachers, for instance, really consider the child's well-being as a role or an area in health and a health issue. I think when they think of *heal*, they think primarily of illnesses as opposed to the well-being of children. And I think if parents were made aware of the fact that a child's well-being is as important to their health as their physical well-being, that perhaps they might pay a little more attention to it. And I think if doctors—I don't think there is communication; at least I haven't had any from a physician or a pediatrician where there's an area that perhaps they're dealing with a child that may help us to better adjust their learning or our teaching style to their learning.

Recent evidence from neuroscience research described how the life experience of children affects their ability to maintain health and shapes brain development through stress hormones such as glucocorticoids (e.g., cortisol; Gunnar & Barr, 1998). Management of these stress hormones may improve medical and behavioural outcomes for children. Development depends on complex interplay between genes and environment, early experiences impact brain structure and adult capabilities, early interactions affect the hard wiring of neuronal circuits, and brain development is nonlinear, with timing a factor in building knowledge and skills (Shore, 1997). Children at three years of age have brains twice as active as those of adults, emphasizing the time-sensitive differences between children and adults. Social stimulation has a powerful influence on children's development. Vygotsky (1978) recognized this as a potent factor in children's learning. Hertzman and Power (1997) concluded that it is through a combination of "latent effects" and "pathways of living" (p. 211) that childhood

experiences affect health over the life cycle. The latency model proposes strong effects on health later in life because of events that occur early in life. The pathways model emphasizes the effect of early environment on "subsequent life trajectories" (p. 211).

M's descriptions of herself when feeling healthy were in accordance with those of Canadian researchers Tipper and Avard (1999), who identified five strengths-based, child-centred outcomes of healthy development: "optimal physical well-being, learning readiness, secure attachments and identity, social engagement and competence, and smart risk taking" (p. 9). Psychosocial factors may have a biophysiological impact on certain aspects of immune systems (Mrazek, 2001; as cited in Vallis, 2001). In this study from the Mayo Clinic Department of Psychiatry and Psychology, children whose parents had struggled with the demands of parenting were more than twice as likely to develop asthma by age eight than were children with regular parenting. First-year parenting difficulties were significantly and independently associated with asthma at school age. Parents require more community support to minimize stress on the child. M's mother stated that if both M and her family were well supported, their level of healthy abilities would increase, contributing to increased strength in themselves as structures. Therefore the family's contribution to structural or ecosystem integrity, itself, would be strengthened.

M inherently knew that she needed "lots of help" from many systems around her, especially when she was not feeling well. She sensed the trust and relationships that she required to feel healthy. Because of her lack of immune response, it was a very important and legitimate goal of community linkage to protect M and rigorously guard all her environments:

> There are least four physicians involved in M's care, so . . . it was complex and took a great deal of reliance on others . . . because she has two remarkable deficiencies. One is her lack of immunoglobulin production, and that's why she gets the IVIG. The other is significant leukopenia. Her leukocytes are very low, and so one has to be afraid that she may not have the resilient immunity either that it takes to stay healthy. So far so good, though. (physician B)

Since the early part of the century the societal definition of child health has been narrowed, and interventions have been primarily medically oriented (Klerman, 1997). The health sector has been narrowed and separated from other important elements that

help to provide child health. In turn, many other disciplines have not been able to use their skills and work with others in promoting broader elements in children's health. According to physician A:

> The initial support comes from the family structure, both in nuclear family and then the extended family if you have those available to you. And then it sort of extends into the community around you, whether that be a physical neighbourhood or a community like a church community or an ethnic community or where you sort of seek your social environment, and those communities become quite important for children as they grow up because there they get more sort of a definition of who they are. And then if they have some form of illness or a medical condition, ideally those communities will still be able to sort of support them in that. . . . It sort of grows out of . . . slightly larger and larger circles that support that child.

There is a great need for political courage and the education of legislators, professionals, and the public about how children's health and sensitivity to physical, emotional, and economic environments may differ from adult health (Klerman, 1997). The study's ecosystem-level charts describing linkage processes, barriers, and positive facilitators confirm this assertion. Understanding is required within societal power structures as to how to promote the health of children beyond medical aspects of care alone (Figure 3). Children, families, and communities require the ability to maintain health in order to self-organize, build their structures, and sustain life.

The Ability to Cope With Stress

M and her mother vividly described their ongoing efforts to use linkage to cope with the "chronic, continuous stress" in their family. M's barriers to health due to her Omenn's syndrome, as described by M's mother, included the presence of chest and sinus complications, the risk of her bone marrow transplant rejection, the need for IgG infusion in hospital every two weeks, low energy levels, and low antibodies and white-cell counts that necessitate rotating antibiotics and other medications to prevent overwhelming infection. Gene-therapy transplants are a source of hope, but are years away. Her overall health was not stable at the moment. Both M and her mother described how their personalities could change when they were low on energy, anxious, or fearful. M confirmed that she needed close communication as she struggled with the changes in her body. When M had to be kept more isolated at home or home-schooled, her social life

and learning suffered and her stress levels increased. M could often sense whether broader linkages had failed in some way, if there was withholding of information about her disease or insufficient acknowledgment about how she felt when sick.

There is strong evidence that memory, focused attention, and self-control all may be affected by experiences that result in poor regulation of glucocorticoids (Gunnar & Barr, 1998). Gunnar and Barr stated that stressors such as prolonged pain and attachment problems often result in loss of dendrites, synapses, and nerve cells. Secure relationships buffer the hypothalamic-pituitary-adrenocortical axis stress system. M and her family had had many stresses to cope with since her birth: isolation from very early childhood, repeated traumas for child and family, inconsistency of follow-up, lack of supportive services, lack of learning support and lack of support from nursing to help with adjustment into community, and the long-term adjustments to her condition. Relationships with physicians and teachers were positive and buffering, but gaps in linkage support remained. Chronic stress is the outcome.

Study participants and the documents indicated that the stress for many children and families during early childhood years is often significant because of limited community supports and linkage infrastructure. Currently, early childhood supports and sites are not well developed or well linked (Mustard & McCain, 1999). Similarly, linkages around schools and child health areas are not developed to sufficient breadth and depth according to study participants and documents.

Stress may facilitate or hinder relationships. Stress in a sick child or a parent may bring out certain characteristics in the child or family, including aggressiveness that may be more challenging to manage. Other cultures may see and use different chronological time frames and societal values than the professional involved does (child advocate, physician A). Linkage encouraging trusting relationships helps to mitigate this dynamic. The child advocate stressed the importance of building the confidence for relationship building:

> Self-esteem, some sense that they are people with abilities and skills and they have sort of inherent worth as a person would be the first thing that kind of comes to mind, and something that oftentimes young people in the child welfare system lack. So their self-esteem or confidence that they can in fact do things, they can learn things, they can be successful. Then they have some chance for that to

> happen. If they don't have the belief that they're worth anything or that they will amount to anything, they're probably not going to.

Too much focus on disease or what a young person could not do does not facilitate the necessary conditions for linkages that focus on making "disease work in healthy living" (physician A).

Continuous community stressors also have profound effects on children/youth, institutions, and systems. Current research from severely neglected Romanian children from orphanages showed that about one third of those who were there beyond their first six months suffered persistent intellectual and social delay despite being adopted into caring homes (Gunnar & Barr, 1998). Study participants described many parts of the systems as being in a state of stress due to lack of resources and insufficient linkage practice. Significant gaps and linkage barriers have resulted. It causes "revictimization" and "a hunkering down" (child advocate) within boundaries, with little inclination to reach out. According to the findings of this study, collaborative societal linkage infrastructure could counteract some of these stressors to enable the ability of communities to cope with stress at each level of the ecosystem for childhood.

The Ability to Sustain the Greatest Possible Ongoing Development, Biodiversity

According to study participants and documents, ecosystem linkage patterns with effective outcomes are required for development of self-identity, constancy of support, and sustaining the healthy abilities for childhood. M's description of herself to develop her potential contained each of the four healthy abilities of ecosystems. She stated that she needed to trust that her particular situation was understood in the classroom, at home, and in the hospital. Her linkages with her peer group are very sustaining to her. They "make me laugh and make me feel better. . . . I can play with my friends all the time even if I feel gross." Those looking after and interacting with a child help the child form an opinion of him/herself, develop trust, provide constancy and sustainability of relationship, and help children "learn how to live" (physician A). According to physician A:

> The way we form our opinion of ourselves, as far as I understand anyway, is from the interaction with the environment around us. Now, usually it's a parent-child relationship, but then they also involve the day-care worker and child, a day home

> and the child, and other children as well in those situations. It's sort of the constancy of relationship. You hope that the relationship between the child and another individual will stand over time a little bit so the child can learn to trust and interact with that person. . . . I think the one thing that I would look at for children is to be able to have a long-term relationship with an individual, not with an organization, not with the government Social Service bureau or something like that where you have different people all the time; but have a good one person that they know, that they trust, they can get to know well.

Self integration is a critical ability for children and youth According to Keating and Miller (1999), "Developmental integration of neurophysiological circuits, . . . creating habits of mind" (p. 232) whose patterns are expressed through regulatory systems, competence, and coping behaviour is significantly influenced through the quality of interpersonal relationships and learning environments across settings, especially early in life. Furthermore, "a key pathway to competence is thought to be the development of regulatory systems" (p. 232). It becomes imperative to understand such pathways for the healthy child to create the community linkage infrastructure that also reinforce them through community "habits of mind." The study indicated that the clarity of roles for the attainment of outcomes using these pathways had not been fully clarified.

Participants indicated that for the promotion of bio-diversity and for greatest possible ongoing development, communities should be sharing knowledge in much greater depth. Interactions between ecosystem levels need to respect their interdependencies. The study held that child health and children's services sites, schools, and early childhood areas should have a strong social role and contribute to macro-scale linkage patterning, including public participation. They were seen as having an important knowledge-sharing role to promote and sustain health in childhood. Currently, this role requires much more development. In the documents reviewed, roles and responsibilities to achieve this depth of linkage lack clarity, but there appears to be movement in this direction.

The government representative commented:

> I'm saying that there are many different areas that we need to be concerned about, some as a society. We have to look at the role of children and the role of parents in supporting children and of society in supporting parents, so that those are the big issues. And then behind that come in the service-delivery systems that we put in place as well. Children come into the world with different skills, abilities, and

> potentialities, but we would be working to maximize the opportunities for that child to make the most of what they have. From the family's point of view, we would be working to maximize their capability to be a support to each other in the family and to optimize the chances for success of their child. So again if you look at the National Longitudinal Study on Children and Youth, you'll find that children who have positive parenting are the ones that are doing the best, rich or poor.

In order to promote the greatest possible ongoing development for childhood in the ecosystem, the study confirmed the important social and pedagogical roles of the school. Greater emphasis on understanding and implementing the linked concept of health/learning is a major need expressed in the study. Such linkage brings educational outcomes that are also health outcomes (Shonkoff & Phillips, 2000). Linkages to other disciplines and community supports were seen as having an important role in preventing an underestimation of what is important to a child and an inability to judge what the child needs to be healthy. According to teacher A:

> I think we understand there's a problem, but we don't have the time nor the knowledge to go into it, to delve into, to find out what the area is and the strategies that can help us deal with that or how to improve it in the classroom. For instance, if we know a child is suffering from depression, then if this physician said—we got a letter or whatever—and I realize it's part of their time too—but we had a letter saying, "So-and-so has the effects of depression, and these are some things you can do to help him in the classroom," that would certainly help us, because we just aren't knowledgeable in those areas.

Early childhood centres remain undeveloped as leveraged linkers, leaving a significant gap in Canadian communities, for the early years (Mustard & McCain, 1999).

The linkage goal of "greatest possible ongoing development" demands timely development and use of knowledge according to an ecosystems perspective. Knowledge development that determines the molecular biological outcomes from the structuring of ecological elements within communities is greatly needed (Shonkoff & Phillips, 2000). Community research of this kind is slowly becoming "benchtop," with quantitative study emerging from qualitative work. Site-based research occurring in schools and early childhood areas in communities is critically needed according to the study. Shonkoff and Phillips, in a large-scale review of research, found that many daycare and early childhood programs have a lack of understanding and knowledge about the child as a whole and are

not providing a sufficient degree of nurturing relationships and expertise to provide a comprehensive range of supports for the interdependent elements of healthy development. Study participants confirmed that knowledge that is available is often never used. Professional and community leadership is developed through ongoing organizational learning. Keating (1999) emphasized that the "learning society" is a human development agenda. He described the learning society, where "change is a continuous process, that it can be brought to conscious awareness in which goals are made explicit, that it involves the broader society and not just communities of experts" (p. 247).

Achieving greatest possible development in childhood necessitates strong advocacy for childhood. Study participants stressed that advocacy is hard work, but it is needed to protect the vulnerability of children and families. A key to its strength lies in the formation of effective participatory structures and processes in many areas of society and across continuums of formal and informal processes of care. The study indicated that these structures have not been fully developed in Alberta. "Socially distributed intelligence may become increasingly central to societal success" (Keating, 1999, p. 247).

Study participants felt that government sectors need to work more efficiently together, that linkage expertise has not fully developed, and that communication remains vastly underdeveloped. The child advocate stated:

> I think the concern for the product or the service to the person takes a back seat to meeting budget targets, reducing a caseload. The concern becomes something other than the well-being of the client. . . . In the young offender system, there's no rehabilitation that goes on there. The quality of the food goes down. . . . That's paring services down to the bone so that they can't do anything more than basically warehouse these young people. There are few alternatives to zero-tolerance policies that are available or put into practice effectively for youth who have not adjusted to regular school environments.

In summary, the participants and many of the documents emphasized the importance of much greater depth in linkage infrastructure to encourage relationships that foster self-integration and diversity among children, families, and communities; the meeting of specific health challenges; a strong health/learning link; and knowledge-sharing linkage to prevent underidentification of needs in children, families, and communities. These linkage activities are contributors to "the greatest possible ongoing development in

childhood" and provide sustainability within the ecosystem that enables the fourth ability: to maintain development despite human interruption.

The Ability to Maintain Ongoing Development Despite Human Interruption

According to study linkage patterns in study findings, when linkage processes are leveraged, they could protect against vulnerability and "human interruption." Without such structure and process, children, families, or communities themselves could succumb to human neglect or abuse. Without constancy of important relationships and consistency of support, children, when they are very young, may have difficulty trusting, realizing their potential, and maintaining the will to live. The child advocate stated:

> And although in that case the young person ended up committing suicide (his stepfather had attempted it three weeks prior to him being successful in doing it), there were certainly indicators. He was reported as telling a teacher at the school that he felt empty inside. That's sort of some flags with respect to suicide. There wasn't an effective kind of follow-through. So we're depending as a society on teachers to teach children to be monitors of their mental health and their well-being. Some may be more skilled at that than others; generally, it's not part of their training in any large scale. And if they do find issues, where do they go with them? They don't have anybody in the school other than the principal, who may not have any more preparation or inclination to deal with anything other than educational issues.

Both human and non-human elements have the potential to affect M's abilities. Other children or adults have the potential to be a threat to M's safety and survival:

> Physically, if she were to be bumped or punched in the stomach, her Portacath would be—oh, she would probably faint if she got punched in it. And physically, she can't keep up to all the other children, and you get teased when you can't, and there's no getting around that. I tried to prepare her with what to say. At the beginning of every year I go in and I say to them, "Look, you cannot feed M., okay? . . . And one day she might take something that could kill her." So I'm pretty straightforward with it; I don't hide behind pretty words. (parent)

M requires constant vigilance within her family, school, and community environments. She is vulnerable to severe infection or allergic reactions and relies on the proactivity of her community and the curtailing of many aspects of her own life to protect herself. Her feelings of vulnerability affect her behaviour. Other environmental ecosystem elements might harm M; for example, smoke, grasses, germs, and viruses.

Unpleasant treatments and the frequency of feeling ill may cause M to lose trust in those close to her who tell her that they may work. Some "terrible memories" (parent, 2001) have developed for M. Her early development has lagged, and M has lost some of her health status over the last five years. At present, her desire to live is strong, but her mother has recognized that M at some point may become afraid and "may not want to live." M's mother requires productive community linkage to help her gradually teach her daughter how to cope with fear and manage proactive environmental protection of her micro-system as an ongoing linkage goal.

Descriptions in the study emphasized the vulnerability of all children to human interruption. Medical needs may be more easily identified, but other more invisible needs may go unmet, such as emotional needs, insecurity, and feeling different from other children. The child advocate stated, "Teachers at times interpret decreased ability in the child to do certain activities as laziness on the child's part due to a lack of the teacher's knowledge of some childhood conditions." The complexity of children's needs in certain environments may not increase tolerance in the classroom, according to physician A. It may just as easily result in "cruel teasing" (physician A), one form of human interruption of healthy development. Rigid institutional policies or destructive families as informal institutions may prevent support rather than protect the child. Ignorance and failing to act to protect children and youth in regions or provincial systems were also considered a lack of this crucial ability (child advocate). According to Dr. B. Perry (2000):

> The very same neurobiological mechanisms that make children so capable of absorbing new experiences in such a short time (language, motor skills) make them more vulnerable to bad experiences. . . . Children are not born resilient: they are made resilient by having opportunities in early childhood. (PowerPoint presentation)

Perry stated that exposure to traumatic stress could have an impact on a child for life through heart disease, alcoholism, and chronic neuro-psychiatric disorders.

The community's ability to meet the needs of the most vulnerable children such as those in child welfare has still not been addressed, according to the study findings. To sustain healthy abilities that protect vulnerability in all children, families, and communities, much more effective linkage patterns across micro- to macro-levels, equitable access, and knowledge resources were seen as critical. Drummond (1998)

recommended an emphasis on capacity building in children as an important element of achieving a healthy childhood, rather than the usual deficits assessment that is often used for funding and assessment. At present, according to the findings, this vital linkage infrastructure has not been implemented to the depth where all children are protected from "human interruption" within their ecosystem. According to the child advocate:

> And there's this not only fairly routine turning them out at age eighteen; there's a huge problem with them being turned out at sixteen or seventeen, sixteen; in some cases fifteen, because they're not compliant; they're not following all the rules; they're not going to school a hundred percent of the time; they're not meeting expectations that social workers have for them, which are maybe well beyond their capacity to reach. They get revictimized in the system.

According to the study, coping with "human interruption" now requires much greater depth of ecosystem linkage infrastructure, with goals to maintain trust in the supportive abilities of family and community institutions and natural elements, to promote self-support and the will to live in the face of difficult challenges, reduce fear, protect the child/youth, and nurture the child's understanding of the challenges of life experiences. These linkage goals, which include natural environmental systems, require sustainability and are a great challenge, but an essential responsibility of society. Diversity in childhood conditions and contexts without the supportive linkage structures throughout the ecosystem may have dire effects of human interruption such as under-identification of needs, abuse, bullying, humiliation, and social segregation (physician A). The line between courage and fear for children, families, and communities is a fine one.

Ecosystem Integrity (ESI) for Childhood

Understanding what is all around us in an "ecologically integrated way is to see this particular thing in place, located in a patterned nest of interdependencies without which it would not be what it is" (Jardine, 2000, p. 70). According to the study, it is critical that children have an engaged network of human and non-human relationships in order for them to survive. This study did not include the other natural environmental systems that are critical for a more complete description of ecosystem integrity for childhood. The concept of the ecosystem integrity of earth's systems could benefit from

both a human and a non-human context and further delineation of structure/function feedback within the ecosystem for childhood. The following section briefly discusses ecosystem integrity with contributions from systems theory, systems interdependence at cellular levels, Westra's (1998) philosophy of EI, as well as the additional contributions from the study and other literature to the evolving concept of ecosystem integrity for healthy childhood.

Systems Theory

General systems theory became known through Ludwig Von Bertalantly in the 1920s to help explain biological phenomena in a broader way. The basic principles of systems theory evident in the literature are interdependence, holistic structure, homeostasis, non-linearity, and complexity (Briggs, 1997). The findings from this study have provided evidence of how ecosystem interrelationships have the potential to work together to contribute to ecosystem integrity for childhood. If families are well linked and supported, they will have the abilities:

> to nurture and support each other, to understand and consider each other's needs, respect individuality as well. I think, in terms of parents, to understand child development, human growth and development, and sort of what to expect and how to respond in a way that's helpful for children; an ability to . . . deal with difficult circumstances as they arise. (child advocate)

The issue of self-integration has long been recognized as a critical part of healthy child development requiring community systems. Social arrangements or community activities of childhood within the ecosystem are an important reinforcer of self-integration for the child and therefore a responsibility of a healthy society (Bronfenbrenner, 1979; Schiamberg, 1982). All of the study participants saw the importance of this vital goal for M. According to teacher A, the role of the school was to

> make a safe and caring environment for the students, . . . the total group of students, and help them to identify what areas perhaps they could work on if they have a particular weakness and teach them particular strategies for getting along with others and the things that are necessary in life, accomplishing goals and accomplishing tasks.

The participants indicated that inter-human relationships are important, but are not enough. In addition, healthy organizational and environmental systems relationships are

essential within the child's ecosystem. Children are biologically interdependent on both human-to-human relationships and on relationships with other natural systems around them, for survival and for ongoing development. Recognizing the effects, implications, and responsibilities for this complex interdependence is critical. Increased use of assessment of functional capacities, including self-regulation, interpersonal skills and relationships, knowledge-acquisition skills, and problem-solving abilities, is evident (Shonkoff & Phillips , 2000).

Optimal outcomes desired by both study participants and documents reiterated that with such precedent it has become vital for programs and practices to seize opportunities to use this interdependence as direction for linkage goals for childhood. The structuring of both human and non-human elements therefore is critical for the linkage mechanisms that work toward ecosystem integrity for healthy childhood. The many barriers to linkage described in the study indicate that the discussion in childhood should be deepened to include how societies facilitate the state of ecosystem integrity extending from ecological integrity for children and how this in turn may contribute to the state of ecosystem integrity and ecological integrity for the society as well as for natural systems.

Interdependence of System's at the Biophysiological Cellular Levels

Ecological systems for childhood are required to support the life processes of the child. Carrieri-Kohlman, Lindsey, and West (1993) described an understanding of health through a biological framework using "physiological human response phenomena" (p. 1). This framework of life processes that support wholeness are biological, including the psychosocial, in nature: cognition, generativity, motion, protection, sensation, regeneration, regulation, nurturance, and perception. All of these processes are included in Westra's (1998) healthy abilities for humans, to the level of survival. Therefore for wholeness in the child, support for these life processes by earth's systems, including human communities, is vital to achieve a healthy being. The use of this conceptual approach to view phenomena necessitates a multidisciplinary dialogue (Carrieri-Kohlman et al., 1993). Collaborative linkage structures and processes at micro-, meso-, exo-, and macro-levels of the ecosystem are vital to support such life processes, according to the participants and documents.

Expectations of solving the nature/nurture debate involving interrelationships within the ecosystem has increased with the Genome project. The nature versus nurture debate is now considered "scientifically obsolete" as "genetic and environmental influences work together in dynamic ways" (Shonkoff & Phillips, 2000, p. 6). Genetic discoveries would primarily serve to increase awareness of nongenetic disease factors such as social and environmental influences (Jones, 2001). Genetic predisposition, along with social and environmental interaction, contributes to the complexity in determining causal factors. A most important question is how early experience shapes individual development, "how environments influence the expression of genes and how genetic makeup combined with their children's previous experiences affects their ongoing interaction with their environments" (Shonkoff & Phillips, 2000, p. 7).

A wide range of environmental stresses to the developing nervous system creates potentially harmful ecosystem dynamics, including poor nutrition, infections, environmental toxins, drug exposures, and chronic stress from abuse or neglect. In children there is a "considerable degree of developmental plasticity" (Shonkoff & Phillips, 2000, p. 30), and early damage may be reversible with later opportunities, but the early years are important (p. 383). Development in the early years is both "highly robust and highly vulnerable; . . . it sets a sturdy or fragile stage for what follows" (p. 4). The brain has an ongoing capacity to resculpt, but a focus on very early years is clearly not enough. It appears that "the neural systems supporting cognitive, emotional and social competencies remain open to experience at least through adolescence" (p. 390).

To advance knowledge of children using an ecological systems context requires the linkage of research areas about childhood in neuroscience, in molecular and behavioural genetics, and with inclusion of how community structuring contributes to the molecular biology of the child (Shonkoff & Phillips, 2000). Several major recent experimental studies suggested that neighbourhood characteristics may influence children's healthy development more than other non-experimental studies appear to indicate. Another large study with experimental design showed decreased rates of injuries, accidents, and asthma attacks; and rates of behaviour problems among boys when families could move to low-poverty areas. At a cellular level, Coe (1999; as cited in Shonkoff & Phillips, 2000) found that the production of superoxides by neutrophils,

needed for fighting bacterial infection, is much higher during final-exam week and for two weeks afterward in both healthy and asthmatic adolescents. These superoxides are useful, but when overproduced, they are aggravating to healthy tissue, and this was hypothesized as a physiological contributor to increased symptoms, especially if asthma is not well managed with medication. A subsequent study also found that the pattern of cytokine secretion by lymphocytes also changed during exam week. Cynader and Frost (1999; as cited in Shonkoff & Phillips, 2000) stated that the "self-organizing principles of physics and chemistry reside in the material building blocks of matter itself" (p. 154). Often not considered is that the environmental experiences of a young organism contain "critically important information that is presumed and required to sculpt and mold their brain and nervous system in very lawful and specific ways, . . . essential for self-organizing principles of matter itself for building members of a species" (p. 154). Such abilities, they stated, are critical to healthy development to enable successful coping within the environment and to provide the gene's selective advantage. The achievement of self-organization is critical for the health-defining abilities of ecological integrity that "promoted greatest possible ongoing development" (Westra, 1998, p. 216). There appears to be increasing evidence at the cellular level of the causal effects of the child's environmental, contextual influences. According to the theory of linkages developed in this study, such evidence illustrates structure/function feedback in ecosystem integrity.

Theoretical physics contributes to the understanding of the practical implications of how human life is embedded as part of all matter on the planet (Barbour, 2000; Page, 2000; both as cited in Folger, 2000). The study pre-assumed that linkages are composed of matter with structure and function. Hawking (2001) described the recent strides made in understanding the molecular physics of all matter and the one complete unified theory that will ultimately describe all matter and energy in the universe, including the proposed existence of invisible dark matter. This perspective will help to picture more clearly the concept of ecosystem linkage infrastructure as a part of ecosystem integrity for childhood. The implementation of effective linkage patterns for childhood could be perceived as a conscious, positive structuring of matter and energy within the ecosystem, supporting children, families, and communities to contribute to their healthy abilities. These patterns of matter, some of which are described in the study as the desired positive

outcomes of linkage infrastructure, could therefore become indicators of ecosystem integrity for childhood.

Children's environments include both human and non-human relationships that create the context for where children live and are nurtured. Children cannot be removed from "natural environments" but are included within them. Human-influenced environments are integral to survival and nurturing the young. Human nurturing intricately interrelates with other systems such as air and water. As evidenced in this study, how well these interrelationships are carried out impacts the health-defining abilities of ecosystem integrity for each child, family, and community. Policy, planning, supportive social structures, and other structural mechanisms therefore benefit from such a perspective to achieve the goal of ecosystem integrity for childhood at the molecular biological level and sustain the overall health of the tightly interrelated planetary ecosystems.

Westra's Philosophy of Ecological Integrity (EI)

The study data show that there are key parts of Westra's (1998) philosophy that apply to healthy childhood. Further development of the philosophy is necessary to delineate more fully the concept of ecological integrity for childhood. The following section discusses several major principles in Westra's theory: nonanthropocentric holism, the relationship between ecosystem health and ecological integrity, the role of EI in ethics.

Non-anthropocentric

Westra (1998) used "environmental holism" as the structural concept for ecological integrity and defined *ecological integrity* as the wholeness of ecosystem parts (p. 22). The concept demands "recognition of the commonality among all that exists so that no artificially constructed argument is necessary to link the two areas of concern, that is, human society and non-human individual, species and wholes" (p. 24). However she stated that for EI, her argument reconciled these two areas, "but only at the most basic level, that of life and life support" (p. 24). Her terms for non-anthropocentric holism were to be "wild and as free as possible from human intervention" (95). However, as suggested in this study, because children are deeply imbedded in their natural ecosystem and need

other humans for life support, both a non-human and an inter-human context for the concept of ecosystem integrity becomes imperative for survival and quality of life in childhood. Therefore the study contends that the concept of ecosystem integrity for childhood should be developed from and based on the concept of Ecological Integrity.

Westra (1994) stated that there is a "dis-analogy between natural environmental and social ethical systems" (p. 174). In her concept of ecological integrity, she set human culture apart from "biological/ecological realities of our existence" (p. 179) because in social systems, "other ethics may become supreme" (Westra, 1998, 221). Yet human culture, at present, could destroy the biosphere. Both human and non-human environments may negatively affect the human child. It is noteworthy that even with the presence of natural systems that support EI, ecological integrity and its abilities are unobtainable for many children, including at the level of survival, due to human actions or inactions.

An additional concept is that "ecosystem disintegrity or ecosystem impoverishment and/or degradation are . . . the opposite of the state of integrity or health" (Soskolne & Bertollini, 1999, p. 1). Karr (1997) described ecological impoverishment as occurring in three areas (p. 198):

1. alteration of earth's physical and chemical systems,
2. direct depletion of non-human living systems, and
3. direct depletion of human living systems.

The study data detail examples of negative outcomes in these areas.

To recognize the whole of the planet, Westra (1994) warned against an anthropocentric view and stated that ecological integrity is a concept of "biocentric wholism" (p. 40). "Because ecosystemic wholes are 'prior to their component species, the atomistic, divisive metaphysical systems of the past are no longer sufficient" (p. 8). However, in light of the research described above and the evidence in this study, an atomistic approach has become essential but must have a linked context to other larger metaphysical systems to accurately acknowledge breadth, connectiveness, and mutual impact of other systems. The particular must be seen in the whole (Jardine, 1998).

The study proposes that some inter-human connections are the "natural autonomous behaviour" that Westra (1998) contended happens when systems are in a

natural state. M's parent stated that M needs an intricate balance of both natural systems and human-created contexts to survive. Therefore, for the child, metaphysical holism as ecosystem integrity developed from ecological integrity needs to include the implications of human interrelationships imbedded within the ecosystem. This is not meant to place social systems ahead of other systems. Rather, it refers to the ability of human societies to understand and cope with the non-anthropocentric nature of ecological complexity. It develops their ability to contribute their ecosystem structuring to bring about the ecological goal of healthy childhood.

The study found that it would be beneficial to develop the concept of ecosystem integrity as an extension of the concept of ecological integrity, to include a human context beyond the level of survival. This will further increase the concept's relevance to the realities of children and human societies as imbedded parts of the planetary ecosystem who exercise significant positive or negative effects and outcomes on other systems in the biosphere.

Ecosystem Health and Ecological Integrity

Ecosystem health and ecological integrity are different concepts but intricately linked, according to Westra (1998). Ecological integrity is structural wholeness defined through healthy abilities. She stated that ecosystem health could imply support or manipulation, whereas ecological integrity implies an untouched wild or natural state. From this study's human perspective, ecosystem health and ecosystem integrity are intricately linked in a dynamic interdependent continuum, which involves both natural and other human elements within the ecosystem. Ecosystem health, ecosystem integrity, and ecological integrity are driven by structure and function that feed back into each other.

Ethics

Westra (1998) proposed ecological integrity, wholeness, as a foundational value for ethics and the basis for the principle of ecological integrity. She proposed second-order principles of integrity as public policy guidelines in which the micro-integrity or individual integrity of single organisms must be respected in order to protect individual functions and their contribution to the systemic whole. Westra (1994) aimed to defend a

"value strong enough to ground an obligation" (p. 141). The Global Integrity Project is working to identify pertinent scientific concepts, methods, and moral directives for guiding public policy (Westra, 2000). To consider the principle of EI for policy affecting childhood, and to bring this important ethic into being for children as a foundation for ecosystem integrity, it is vital for societies to increase knowledge of how to organize and structure themselves to bring about support for other ecosystem elements. For societal decision making, understanding the ethic of ecological integrity, as well as the impact of other ecosystem elements, becomes critical to survival. Hence the need in childhood, as depicted by study participants, for linkage infrastructure to traverse micro-, meso-, exo-, and macro-levels of the ecosystem to promote the four healthy abilities.

The Evolving Concept of Ecosystem Integrity for Healthy Childhood

The study has indicated that the concept of ecosystem integrity would benefit from a deepening of perspective to include how societies and natural systems together encourage the state of ecosystem integrity for children and how this in turn may contribute to the state of ecosystem integrity for societies and other components of the child's ecosystem. Study findings and current literature have added to the descriptions of ecosystem integrity. In the following section this is discussed in relation to the structure/function feedback pattern that the study proposes for ecosystem integrity for childhood, the adaptation of Westra's Precautionary Principle, ethical issues, the implications for the research of systems, and the relationship between the determinants of ecosystem integrity and the determinants of health.

Structure/Function Feedback

Linkage patterns determined from the study suggest that traditional meanings of functional and structural dynamics of ecosystems are changing. Structures affect abilities, and abilities, in turn, affect structures. Both structure and function are very interdependent, can be purposefully directed, affect ongoing sustainability, and profoundly affect the state of micro-, meso-, exo-, and macro-levels of the ecosystem. In this dynamic, the interwoven continuum of structures and their abilities create the energy and the matter of structural forms. With more knowledge accumulating about matter and energy, the elements comprising structures and functions within ecosystems, as various

forms of matter with abilities, could be perceived as flowing into each other to create a structural continuum of ecosystem integrity. The study participants described the synergy among child, family, and community linkage abilities that was critical for positive outcomes at all ecosystem levels. The study findings indicated that this perception is key to truly understanding linkage patterns that sustain ecosystem integrity for all life forms, including childhood.

Human and non-human elements that compose linkage infrastructure may positively affect the continuum of ecosystem integrity for the child, human societies, and natural systems. In essence, the interdependence of structure and function of ecosystem integrity could work together both naturally and purposefully to create a continuum of structure and function that is ecosystem integrity. Positive outcomes in the continuum, according to healthy abilities, are indicative of ecosystem health and integrity. Negative outcomes indicate a lack of ecosystem integrity and health for childhood. Ecosystem integrity for childhood could be seen as the ability of both structure and function to enable ecosystem health, which in turn contributes to ecosystem integrity. Preservation of "wildness" in the environment is critical for EI as the base from which ecosystem integrity is developed. It becomes essential to bring a greater understanding of human relationships to the concept of ecosystem integrity and ecological integrity, because of the human's profound impact on both natural and human-influenced environments for childhood.

Robert (2000) stated that models of health using reductionism and holism are inadequate and instead advocated the use of "systemism" (p. 4) to recognize such ecosystem dynamics as feedback loops. According to Levins and Lopez (1999; as cited in Robert, 2000), the "inseparability of social, ecological, physical, chemical, and biotic environments is a crucial framework for a whole-system approach to health" (p. 284). The model for ecosystem integrity for childhood as developed from study findings illustrates the inseparability of these spheres (Figure 3).

Canada has worked on identifying the determinants of health and has supported medical research, intervention, and health promotion, but has ignored the environmental context, with many unsustainable economic consequences the result (Robert, 2000). The reality of the vulnerability and dependence of childhood demands wider circles of linkage

to prevent the neglect of costly gaps and negative outcomes such as those described in the study. Study findings show that both natural structuring and purposeful structuring within societies, using an inter-human and non-human context across multiple systems, is critical to integrate efforts and benefit from linkage infrastructure. Effective implementation requires a realistic appraisal of how ecosystem infrastructure such as natural systems, institutions, practitioners, researchers, families, and policy makers could best be used to enable linkages to deliver support to reach the child. Barkley (1999) stressed the need for support to reach the child's "point of environment" (verbal presentation). Study findings indicate that providing ecosystem integrity for childhood is an ethical, a funding, and a research-to-practice issue.

Adapting The Precautionary Principle

The Precautionary Principle came from the 1992 Earth Summit and states, "Where there are threats of serious or irreversible damage, lack of full scientific uncertainty shall not be used as a reason for postponing cost-effective measure to prevent environmental damage" (Westra, 1998, p. 13). Westra described the need for the precautionary principle for ecological integrity because the human species is the only one capable of inflicting "irreversible damage to the capacities of the system; hence its integrity" (p. 214). Human species may also inflict such damage on its own species, rendering this principle an important one to adapt for childhood to bring a sufficient depth of linkage that achieves pro-activity in community systems. Study participants indicated that timely protection and nurturing of the child are critical societal responsibilities. Significant gaps in this essential area remain, according to study evidence. There is a lack of interdisciplinary supports, lack of standards for more integrated community practice, for public participation, and for equitable monitoring of children in the child welfare system. An adaptation of the Precautionary Principle for ecosystem integrity would greatly benefit public policy for childhood. To acknowledge both the inter-human and the non-human elements depended on by childhood for survival and greatest ongoing development requires the use of an adapted Precautionary Principle that includes an inter-human context, as well as its context within ecological integrity, in recognition of complexity and uncertainty in the ecosystem for childhood.

Ethical Issues

Another important dynamic affecting ecosystems linkage infrastructure from an ethical perspective is the struggle to meet both individual human rights and group rights. The ethics of ecological integrity (EI) must have the "primacy of the integrity of both individuals and wholes" (Westra, 1998, p. 47). Democracy as a linkage dynamic is "not enough" (Westra, 1998, p. 53) to protect all life. Such micro and macro issues are some of the most profound in our century (Ignatieff, 2000). Many of the study participants found that the required depth of human support for childhood is ignored in society and there is significant underestimation of the child. Currently in Canada, self-determination is in the Charter of Human Rights in the Canadian constitution, raising it above moral values. Self-determination and the mediation of individual and group rights was often an important linkage goal in study evidence. According to the study, the influence of globalization requires the ability for broader, more effective human linkage to meet this goal. Jardine (2000) stated that this context of a "sense of community or ethos" (p. 101) is critical for ethics. The interdependence of the human-environment relationship makes all of ethics ecological (Peacock; as cited in Roberts, 2000). The implementation of ecosystem linkage infrastructure with goals of equity and access are an important way of contributing to the resolution of some of these critical, controversial micro- to macro-level issues.

Ecosystem Research

The complexities of research in childhood benefit from numerous research methods that use an ecosystems perspective. The government representative stated that site-based research to develop knowledge about healthy school communities has not yet been undertaken in Alberta. Action research offers the ability to interpret the human world, the ability to deepen the understanding of language, and the ability to increase knowledge about how understanding occurs in the human world. It includes the role of phronesis as "ethical knowledge that is grounded in a concern for others, that mediates between the universal and the particular" (Kanu; as cited in Carson & Sumara, 1997, p. 171). According to Carson and Sumara, action research has "become increasingly more aligned with critical ecological thinking" (p. xx). More deductive research about

ecological systems would grow out of interactive research (Shonkoff & Philips, 2000; Westra, 1998).

The study participants and documents, in describing desired outcomes of linkage, detailed the necessity for wholeness in the linkages among human and non-human contexts. Social indicators in Canada are assuming increased importance. Canadian Finance Minister Paul Martin (2001) has given $10 million to Environment Canada and the National Round Table on the Environment and the Economy to develop a new set of indicators to measure sustainable development. These indicators are to measure changes in social and natural capital to inform economic policy and political debate. More community health indicators are needed to assess health as "a balanced system of individual, community, and the environment" (Hess, 1999; as cited in Soskolne & Bertollini, 1999, p.56) to bring about the goal of a much stronger partnership between science and policy. The beginning theory of linkages for ecosystem integrity in healthy childhood, as proposed in this study (Table 3), could inform such community health indicators. In addition, this study has piloted a unique mix of three ecological systems methods. In the study, patterns of linkage infrastructure that bring about the healthy abilities of ecosystem integrity are community indicators of ecosystem integrity at micro-, meso-, exo-, and macro-system levels for childhood (Figure 5, Table 3). When Bronfenbrenner's (1979) ecosystem levels are developed as indicated, the dynamics of Westra's (1998) healthy abilities, and ecosystem integrity for childhood, could result (Figure 3).

Mutual Determinants of Ecosystem Integrity (ESI) and Ecosystem Health

Westra (1998) illuminated the prerequisites to health: "Sustained health requires integrity of earth's natural systems" (p. 37). The patterns of linkages in the study show that for systems to have structural integrity, they need to be formed from health in the ecosystem. This mutual dependency creates a non-static feedback loop within earth's systems (Figure 4). Ecosystem integrity formed from ecological integrity, as well as ecosystem health, are created from structure and function and benefit from a perspective seen through the abilities of children, families, societies, and natural systems. Structure and process are inextricably linked (Corbin & Strauss, 1998, p. 167). In the study they form linkage infrastructure as a vehicle to implement this wholeness for children.

Therefore, the concept of ecosystem integrity, developed from ecological integrity, is a determinant of health, and health is a determinant of ecosystem integrity.

A systems view of ecosystem integrity for childhood emphasizes the importance of the interweaving, porous, interrelated boundaries in the human and non-human context (Figure 4). However, some linkage infrastructure should be created strategically, according to the study findings. As participation increases, there is increased consciousness about childhood and increased linkage for its goals. Jardine (1998) cited the origins of *ecology* as eco "dwelling, abode" and *logos* as a "spirit, inner fire . . . allowing a nurturing into their own" (p. 3). He saw education as

> a deeply earthly task, part and parcel of the breadth of the earth. . . . Ecology offers . . . images that break out beyond the confines of the human voice out into the pitter-patter of the animate, living Earth, of which the disciplines of schooling are a part, not an exception. (p. 3)

Daily (2002; as cited in Glausiusz, 2002) argued that economic self-interest is the best way to protect the environment because the services provided by the ecosystem are a form of capital. Greater human understanding of structural integrity that includes human linkages is critical to the achievement of the goals of both ecological integrity (EI) and ecosystem integrity (ESI). The critical importance of human inclusion in the concept of ecosystem integrity, extended from ecological integrity, is supported by the findings in this study. The beginning linkage theory for healthy childhood (Table 3, Figure 3) can contribute to the concept of ecosystem integrity. Sustaining ecosystem integrity requires a deep understanding of the molecular earth and all of its elements, of which humans are a part. Jardine (1998) reminded us that we "are human, . . . full of humus, fully imbedded in the life of the earth" (p. 76). Ecosystem integrity for childhood relies on understanding and preserving particularities within the wholeness of ecosystems. For societies it requires a sense of responsibility and commitment to protecting vulnerability and encouraging renewal.

Collaborative Linkage Infrastructure

A framework of linked support that is family centred, interdisciplinary, flexible, and focused on building strengths is critical (Weiss, 1993). However, increasing the scale of these initiatives, an essential characteristic to achieve successful implementation has

proven difficult (Bruner, 1991; Crowson & Boyd, 1993). In this case study, ecosystem levels showed many elements within community linkage infrastructure that need to be enhanced before successful linkage infrastructure for childhood is achieved (Figures 5, 6, and 7).

Four major areas of linkages are considered significant, according to the literature review: service system integration, school and early childhood linkages, public linkages, and linkages for knowledge development. These four key areas, as described in the literature review, will be discussed. The discussion concludes with a section on the institutional dynamics that are major factors in collaborative linkages. This is a significant area requiring greater knowledge development, according to the literature review.

Service System Integration

Kagan et al. (1995) provided a definition of service integration with a key emphasis on the ingredients for the healthy development of children and youth:

> The goal of service integration is to increase the efficiency and effectiveness of systems providing human services, through infra-structural reform (e.g., improved professional development, regulation, financing and other supports), and direct service reform (e.g., increased number of services, more equitable distribution of service and higher quality services). . . . The goal of service integration is to . . . enable children and families to experience a higher quality of life. (p. 12)

Kagan emphasized that service integration linkage goals must address both systems and people.

Transforming service systems of health, education, and human services, including schools and medical care, is part of the solution to major needs and gaps in service integration, but not all (Bruner, 1996). The most essential ingredients for process are in four major areas:

1. new forms of family support at front-line practice which use family partnership for goal setting and holistic approaches.
2. reconstructing public systems to build on principles of prevention and a constructive engagement of families and their needs to participate in actively building the social bonds in communities.
3. encouraging collective action for networks of support.

4. creating economic opportunity. (p. 2)

The supportive linkage patterns identified in the study as critical for communities occur in these four areas. Therefore, these are the areas where linkage infrastructure needs to occur. Though much is known about children and families, the study found that it is less well known what specific community linkage structures were effective and why (Shonkoff & Phillips, 2000; Weiss, 1998). Positive or negative linkage outcomes frequently lack recognition or acknowledgement, according to study participants. Implementation is a struggle even though

> what is needed to help children succeed at high levels is already known, and that vision and commitment are essential to bring about reform efforts that research has already established as effective. Conditions that contribute to academic success and well being include nurturing and supportive families, economically and socially healthy neighbourhoods, and effective public service systems. (Bruner, 1996, p. 1)

The participants and many of the planning documents in the study emphasized the importance of outcomes requiring a systems perspective to create effective linkage infrastructure to meet child, family, and community needs. This was evident in such documents as the Student Health Initiative Partnership, the Alberta Initiative for School Improvement, Children's Mental Health Initiative, and Region 10 Ma'Mowe planning process. A systems theory model was advocated for early intervention teams and integrated services models because it recognizes the complex, dynamic, reciprocal nature of the influences between child and caregivers (Bonner & Finney, 1996; Briggs, 1997). The use of infant mental health principles and family-centred care that holistically address social, emotional, behavioural, developmental, sensory, and regulatory issues in the child is a key paradigm for integration into early intervention services (Steele, 1998; Weston et al., 1997, as cited in Steele, 1998).

Service integration is no longer considered the only strategy for reforming the human service system (Kagan et al., 1995). It must work in partnership with other movements that focus on advocacy, outcomes-based accountability, and specific needs and also involve parents as experts and consultants (Kagan et al., 1995). There are four important functions of service integration (Kagan et al.):

1) to bring together previously unconnected services
2) to overturn past practice, policy, or bureaucracy
3) to create mechanisms that work to promote and sustain integrative strategies
4) to change relationships for and among people and institutions. (p. 12)

The challenge today is to move from programs to a community framework of support for a new service system characterized by comprehensiveness and continuity achieved through collaboration and networking (Weiss, 1993). It is important that initiatives not become disjointed and revert to mere programs (MacDonald, 1994). The community systems approach is an emerging collaborative concept. Community systems initiative in Ontario "builds community consensus regarding optimal outcomes for children, and then develops a unified community plan that . . . is employed to achieve these outcomes" (Shields, 1995, p. 617). This contrasts with the traditional approach of creating programs to deal with problems. A community systems approach can build healthy community abilities. The study descriptions of structures and processes for linkages stress the importance of linkage goals that aim for the abilities of ecological integrity, to bring about these health-defining outcomes in children, families, and communities. The beginning theory of linkage for healthy childhood (Table 3), as proposed in the study, may contribute to implementation of full human and non-human frameworks of support within the ecosystem for childhood.

For systems to be successful, the connection between governance and grassroots must be "synergistic" (Weiss, 1993). Synergy cannot be achieved in fragmented, bureaucratic systems or those that are impersonal, concerned with turf, and only treatment centred (MacDonald, 1994). Effective interagency or intersystem initiatives occur on a continuum delineated by cooperation through coordination to collaboration (Crowson & Boyd, 1996). Linkage infrastructure as advocated by the study participants has the pattern of primary, secondary, and tertiary cross-sectoral continuums of linkage, including linkage structures that leverage the positive outcomes of collaborative linkage.

Professionals and caregivers who work with young people have an informing role, a knowledge-sharing role, and the responsibility to meaningfully include children and families in decisionmaking. All of the participants indicated that there are currently not enough bridging or coordinating roles and services across (inter-sectoral) or within (intra-sectoral) the systems. It is known that in a vertical integration of a pediatric service,

integration brings improved continuity of care, greater educational opportunities, and increased participation of senior clinicians (Racine et al., 1997). It also creates a clinical research infrastructure and the conserving of resources. The use of allied health professionals from the ambulatory to the inpatient sites is broadened, and interdisciplinary practice teams who integrate the care of pediatric patients and their families emerge. In the study under discussion here, intra-sectoral and inter-sectoral linkage has been minimal within and between child health areas and schools.

Healthy communities have a significant buffering effect toward less healthy ones (Hertzman, 2001). A balance of funding strategies of universality and targeting need has not been reached. Thinking environmentally beyond the range of natural family and neighbourhoods to a full range of community service providers will help achieve this goal (Hertzman, 2001). A combination of the three approaches of clinical, targeted, and universal programs is vital to decrease the "burden of suffering" for children with psychiatric disorders (Offord et al., 1999; as cited in Keating & Hertzman, 1999). Concrete support from research, policy, education and resources for macro-scale abilities of linkage infrastructure are essential to preserve greater scale in community abilities to meet particular needs of the child even if the immediate natural neighbourhood cannot. According to study findings standards for integrated community linkage practice needed to be very clear and enforced to guide meso-relations in all communities including First Nations communities. The child advocate stated:

> The government essentially signs an agreement [with First Nations communities] and says "Go to it" without any concern for, are the staff qualified? Is there training? Is there adequate supervision? The minister is ultimately accountable for what happens, but there's nothing in the process to provide support to that agency as they do their work. There's nothing to monitor how that work is being done.

Steele (1998) stated:

> It is incumbent upon policy makers, services providers to put forward overriding philosophies, theories and practices that govern the context in which those services are delivered. . . . This paradigm shift may involve addressing all developmental domains by all disciplines and the family as equal partners in the discussion. (p. 3)

The Alberta Children's Initiative has " much more work to do," according to the principal, parent, and Teacher B. It lacks depth and sufficient joint inter-sectoral funding as incentive for linkage

In this study, leveraging linkage infrastructure is seen as an important strategy to reduce the knowledge-to-practice gap. Increased implementation of linkage practice, including guideline development according to best practices in linkages for childhood, may slowly lead to the development of large-scale strategies and linkage infrastructure that enables the traversing of micro- to macro-levels in the ecosystems to meet child and community needs. Such practices do not necessarily imply implementation of integrated services under one sector or model. Instead, they are meant to develop an ongoing, more intricate knowing of the community, of its strengths and weaknesses and linkage outcomes.

School and Early Childhood Community Linkages

The linked concept of health and learning is critical for successful, leveraged community linkage infrastructure (Levine, 2000; Keating, 1999, Shonkoff & Phillips, 2000). These linkages need much more development, according to the study findings. Crowson (1992) described the primary mechanisms that are needed at the school level: common values, integrative mechanisms, effective communication networks, and leadership promoting shared interest. The importance of both representational and participatory roles for parents/public participation was acknowledged. There was consensus in the study that in addition to the recognized educational stakeholders, more participation of the public, other disciplines, and community partners, including business, are critical ingredients for creating healthy school communities (Figures 5, 6, and 7).

The school is a significant long-term environmental and public institutional context for all children. All participants considered a greater depth of linkages at schools and early childhood areas as vital for children's healthy outcomes. The study data often showed the desired linkage goal of sustaining "ongoing portability" of constant support across environments. Bartelt (1995; as cited in Rigsby et al., 1995) described the macro ecologies that were at work in schools "embedded in a network of social processes" (p. 161), significantly affecting this environment for children. The structure of the school community is "the child's workplace and their environment when they are away from

home" (physician A), and therefore crucial to the child/youth functioning. The study indicates that effective linkage at the school or early childhood community serves society twofold: First, it encourages the valuing and understanding of health/learning as a linked concept that is key to a well-educated population of children as future parents. It can give access to linkage infrastructure for parents to preserve their ongoing ability to nurture children successfully. Second, it can develop multilevel community abilities and serve as a vital oasis of positive linkages for children struggling with conditions including poverty. The study participants highlighted the importance of using a balanced strategy of linkage that includes both immediate services and linkages promoting long-term health. Implementation of this depth of linkage had not yet occurred in the province on a macro scale.

The issue of how systems change could be institutionalized was significant in the study data. There are four current interconnected movements that could be considered institutional factors that impact the area of school-community relations (Crowson & Boyd, 1993): "Toward increased parental involvement in school governance, instructional partnerships, school to community outreach, and children's service coordination" (p. 140). Linkage in these areas was considered critical by the study participants or in the documents. There was consensus that sustainable linkage infrastructure among all four was not yet the reality in most schools in Alberta. The three common models of service coordination at present are school based in the building, school linked with the school as an integral partner, and community based, with the school playing a minor role (Crowson & Boyd, 1993). The consensus appears to be that the school-linked model is the most effective.

Policy is an important vehicle for ensuring a context supportive of linkages originating professionally and from the community to provide an enriched and safe school environment. In the study it was determined that policy at the school board level requires a greater emphasis on ensuring more integrated inter-sectoral linkage practice at the school and increased public participatory process. "The absence of coordinated policies committed to child health at school makes the idea of health promotion there a mockery" (Mayall et al., 1993, p. 230). There was agreement that coherence of policy across the sectors is essential to sustain the context needed for linkage infrastructure.

Schools have a profoundly important role in drawing the community together, according to the participants and many documents in the study. The school should be a place that "parents and outsiders feel good about . . . and can instil that in their own children or people they talk to" (teacher B). Parents have important multimodal roles in the school community (Epstein, 1995; Marx & Wooley, 1998). The school has significant potential as a learning community that pursues "collaborative knowledge building" (Scardamalia & Bereiter, 1999; as cited in Keating & Hertzman, 1999, p. 276). These authors pointed out that schools are often the student's first experience in a learning community. Home-school-parental partnerships are critical for the successful support of the child (Cicchetti, Toth, & Lynch, 1995). Such partnerships ease transitions between early childhood and adulthood, as well as balancing risk and protective processes in childhood. Parent, community, and teacher partnerships to support learning assist teachers to provide more integration between particular needs and curriculum goals.

Study descriptions stressed that teachers alone in the classroom may not have enough knowledge about childhood conditions and need help and communication with other professionals and community members to identify needs and tailor their teaching and learning strategies and expectations of students. For the sustaining of healthy abilities in the micro system, the students in M's class needed ongoing education about how to support M so that there is no teasing, other damage, or an unsafe environment. This process requires facilitating from the meso-system. Teacher A did a great deal alone, but also stated:

> I firmly believe in making children aware of what's going on around them, because then they can understand it better. And so if I don't understand it, how can I explain it to the children? So perhaps somebody who would come in and give sort of— . . . I guess you can't explain it in a medical way, but so that children can understand where M's difficulties are and perhaps in what way we can help her as a group.

The study participants, documents, and literature were clear that access to other professionals and community members is critical for school staff, children, youth, and families in schools (Levine, 2000).

A core element of the linkage infrastructure processes in school communities requires the achievement of mutual understandings, according to all of the study

participants. For example, from an ecological perspective, Jardine (2000) saw curriculum integration as absolutely necessary for an understanding between disciplines. In dialogue with others, including children themselves, "mutual understanding is sought in such a way that our real differences are preserved while at the same time kinships, resemblances, or analogies of understanding emerge" (p. 170). In the hermeneutic conception of understanding, "identity and difference are not the alternatives" (p. 170). Teacher A stated:

> If I would feel that there was a particular problem area with several kids in my classroom, I would develop some lessons to talk about it, have the kids discuss or tell about their feelings and how they're feeling and what we can do about it to help them. That way we could help them work through this from the area of peers helping peers, because I'm sure different children experience different kinds of things. But when you talk about it collectively, we can bring out strategies that help one person, that may help another one, that would work.

Linkages have the potential to create relationships using a process that preserves identity, differences, and inclusiveness to support the whole child. Fundamental community abilities for interrelationships, learning about relationships, systems, and networks become critical.

Linkage structure and process at the micro-system level benefit from the goal of developing both cognitive and affective areas to promote healthy abilities in children. Teaching children "how to live" is often harder than teaching factual knowledge (physician A). Cognitive intervention often cannot be used to change the affective parts of the child, because in childhood, play, pleasure, repetition and mastery are essential (Perry, 2001).

According to Tyack (1992), the US has a long history of providing what he described as "noneducational" services to children in the school environment. Efforts at bringing health and social services to public institutions are built on two models: the "nation-at-risk model," in which academic performance and international competitiveness are primary goals; and the "child-at-risk" model, in which the needs of underserved children are the primary goal (Tyack, 1992). He contended that the second model should base current reform efforts in the US because these kinds of services and partnerships are not "noneducational." The study evidence indicates that gaps in this area

are significant, and they highlight the need for the primary goals from both of these "models" to be inherent in school-community linkage practice in Canadian community systems.

Most of the study participants were not familiar with the concept of the comprehensive, coordinated school health approach. A very limited amount of research work has been carried out in this area in Alberta (government representative). Much more widespread integration of this concept into school communities as advocated by the Alberta Coalition for Healthy School Communities (ACHSC) in Alberta would assist implementation of linkage infrastructure that supports ecological integrity for childhood.

True school reform is needed to "fully integrate a focus on addressing barriers to learning and enhancing healthy development" (Marx & Wooley, 1998, p. 159). A coordinated and a comprehensive healthy school-community program is characterized as having the following elements: family and community involvement with learning partnerships, integrated curriculum, healthy school environment, comprehensive school health education, physical education, counselling, school health services, school nutrition services, psychological and social services, and school-site health promotion for the staff (American Institute of Medicine, 1997; Marx & Wooley, 1998, Wisconsin Framework, 1997). Study findings indicate that increased emphasis on the linked concept of health/learning should be an emphasis on such frameworks. Research on American schools found that most schools have some of these elements, but few have all of them at a fully functioning level (Marx & Wooley, 1998). This also appears true as a current assessment for schools in Alberta.

Implementation of healthy school and early childhood communities requires strong school leadership, district board policy, and support from district-level leaders. The development of formal and informal school relationships is needed. Essential linkage infrastructure includes healthy school teams with a school health coordinator, district-level advisory committee, state-level advisory councils on school health, federal inter-agency committees for school health (American Institute of Medicine, 1997; Marx & Wooley, 1998). Health-education collaboratives for programs and funding, including non-governmental partners, and building state-level coalitions are considered vital processes for macro-scale linkage. Similar structures in Alberta would assist

implementation of healthy school communities, in light of the individual, site-based model of management of schools in Alberta. The training of district and community advocates, ongoing evaluation, and the provision of time, expertise, and resources to encourage family involvement in the school community and for wider community partnerships must be integrated with other elements of healthy school communities (Marx & Wooley, 1998).

Balancing specialist and generalist perspectives is critical. In Alberta the SHIP initiative, bringing several areas of multi-disciplinary services to schools, has begun the process of contributing to healthy school communities. It has held promise, but to date there has not been a focus on all of the elements of comprehensive school health in Alberta. The Alberta Initiative for School Improvement (AISI) within the Learning sector is an intra-sectoral facilitator of community linkage for schools. Alberta needs implementation of the comprehensive and coordinated school health approach in all schools to meet many of the needs depicted in study findings. For successful implementation, the framework of comprehensive school health (Marx & Wooley, 1998), along with school process involving parent participation processes outlined by Epstein (1995), is proposed in Figure 6, to enable implementation of linkage that sustains ecological support at the institutional level.

Public Linkages

Public participation through linkage infrastructure is a vital ingredient to promote community participation within public institutions at all levels of the ecosystem. Disciplinary language varies for this dynamic, such as *participative process* from nursing, *civic process* from medicine, and *democratic process* from education. Mayall (1993) described the concept of *intermediate domain* between the public and the private parts of society that affect the relationships and negotiations between parents and health staff to achieve child health. How these spheres of public and private interest and responsibility are perceived affects how care is implemented. All of the study participants emphasized the importance of the skills of negotiation and consensus building for establishing linkage infrastructure. The principal emphasized the crucial need for opportunities to teach and learn empathy and consensus:

> I think partly it is age. But I think we could teach some of that wisdom and some of those skills to people when they're young, and then maybe we would have a chance of maybe doing some of those linkages.

Family-centred care implies "constant, systematic efforts to understand one another's view points, and that open negotiation between family members and nurses is encouraged and valued" (Knafl et al., 1988, p. 300).

Relationships with parents were seen as a prime focus of micro- and meso-level relationships in the study. In addition, if parents themselves are not validated and supported, a linkage barrier often formed in the child's micro-system. The parent commented:

> I think that if physicians, or even school people, could listen to you. . . . Yes, there are going to be parents that overdo it, and that's understandable; they're worried about their children. But we have a vested interest in our children, and hopefully—"Put yourself in my shoes. If I have a problem, I like to know that I have the best information possible that I can do to help my child. Listen to me!"

In the CPRN discussion paper *Best Policy Mix for Canadian Children* (Michalski, 1999), Canadians themselves emphasized the need for governments, communities, and corporations to provide supports so that parents can assume more responsibility for their children and have the means to increase their ability to give their children the best care.

A caregiver's sense of guarding the child or family could increase linkage barriers to other caregivers. It could also eventually strengthen them. M's parent described her development of more positive linkage abilities:

> I think maybe I'm becoming more articulate and more forceful. I mean, that's my success, is that I've learned that I don't always express myself the way they want to hear it. I know what I want to say, but I don't always say it the way they want to hear it or that they understand; . . . not that that should be necessary, but it is. . . . And I've learned how to be more forceful in restating my cause.

The study findings emphasize that linkage infrastructure with public participation is essential to prevent loss of trust and under-identification of the needs of children, families, and communities. M's parent had a history of experiences of insufficient linkage and felt that she was still struggling with the school and with the physicians at times:

> I'm still struggling with the school. . . . I struggle terribly with the doctors. When I get upset, I cry and I lose my temper. [I say], "You're not listening to me. You're not understanding what I'm trying to say, and I'm having a hard time saying what I want to say, so LISTEN TO ME!"

All of the participants and some documents described a role for parents, children and youth, and professionals in joint planning, but where and how this participation should occur was not clear. There are no guidelines in Alberta yet for public participation despite several integrated government initiatives for children and the creation of school and health councils.

M's mother described her role as a validator, a voice, and a protector for her child and expected to be treated as such by professionals and other community members: "It's like, I'm not going to sit here. So I've learned how to be more aggressive to ensure the links work, because otherwise who else is going to do it?" Physician B stated:

> The mother's always the best caregiver for the child, and I trust mothers a mile long even if I get frustrated with them sometimes and think it's a nuisance. But I take them very seriously, and so I find the most useful advocate for the child is still the mother, and I take my clues from her, together with the child, of course, clinically.

The Child Welfare Act gives young people the right to have their "point of view heard and considered in the decision-making process" (child advocate):

> I think the Child Welfare Act certainly reflects that; the UN Convention on the Rights of the Child reflects the role of parents and families. But it doesn't give them an unfettered right to do whatever they wish to. There are certain limits and boundaries. That's why we have child protection legislation and laws against assault, to ensure that that right of the family is exercised within reasonable limits.

Children, as citizens, were finally included in the 1982 Canadian Charter of Rights and Freedoms. Canada ratified the United Nations Convention on the Rights of the Child in 1991 to balance the rights of children, families, and communities. This, however, does not mean that the recommendations of the charter were included in Canadian law or policies (Pellat, 1999). In Alberta, the UN Convention for the Child was finally signed without going through legislative process, where, the child advocate stated, it may not have passed.

A community's skill to engage at all ecosystem levels through parent-teacher partnerships for learning are well-recognized elements of school linkage processes (Epstein et al., 1998), but implementation has been more challenging. School councils have been legislated in Alberta since 1995 as structures of public participation in the decision-making processes in schools. However, how much engagement of parents is carried out in schools remains greatly affected by the principal's skill and initiatives, as well as the initiatives and skill in community support.

Parental organizations and advisory councils have an important role in increasing community capacity to approach systems and advocate for all children, youth, and families. When the child or family cannot advocate for themselves, the role of other public participation is critical and reflects a community's ability to promote this linkage pattern to address vulnerability. Natural advocates of some children abandon them. There are a great many "children who nobody cares about being left with a system that has few continuums of care" (child advocate). In other situations parents may not have the skill, energy, or desire to be effective for them. According to the child advocate:

> Oftentimes those articulate young people don't feel that anybody is paying attention to them, that they're either not listening or they're not giving it serious weight or consideration in decision making. They feel frustrated. We often hear, "Nobody's listening to me."

Inclusion of public participation and advocacy in ecosystem processes, according to the child advocate, could help facilitate voice or agency to ensure that

> persons' rights are respected, and their point of view is heard, and that there's some kind of due process involved and an opportunity for them to disagree if they disagree and to propose what they think should happen. This may not win the day, but they have that right.

Sustainability of public participation at all ecosystem levels requires macro-scale public linkage infrastructure. This encroaches on challenging philosophical territory that requires broad societal discussion and recognition of a diversity of views. Parents give voice to many different needs of children. These issues require a discourse to balance the rights of children, families, and communities. Physician A commented:

> And then we're asking, should the government now take on a paternalistic role and say, "No, we don't approve how you are; we want to enforce our view on you"? Those are very broad philosophical questions that are being asked here, and should the government have the right to interfere at that level about how children are raised?

How citizens should bring their efforts to the role of public participants demands knowledge about this role in different contexts. Subtleties within the concept of public participation affect linkage goals in this challenging area. Participation as a responsibility of citizenship and the influence of public politics, social union, and rights are discussed in the following paragraphs.

Kingwell (2000) outlined how the concept of citizenship was changing in an increasingly globalized world. Previous models of citizenship had been based on " blood, conviction, or . . . procedural exercise and access to a body of rights" (p. D6). These no longer serve us fully, and what is now needed, he stated, is a new model based on the act of participation itself as a responsibility of citizenship and recognized as a legitimate element of democracy. The concept of "social capital," he pointed out, could be construed to have negative social causes. Instead, he described participatory citizenship as "a way of making concrete the ethical commitments of care and respect, of realizing in action an obligation to aid fellow travelers, of fostering justice between persons" (p. D6). Therefore, proactivity of linkage infrastructure for public participation is critical to prevent inequity of opportunity and include all children, not just those who have the means for easier access to the system. According to the child advocate, the regional authorities such as child and family services authorities have been newly created and are

> not divorced from the government; in fact, they are Crown agencies, and they have an accountability to the government. What I think is positive about that is the boards that govern those authorities are not government employees; they're citizens form the community, although appointed by the minister. But nonetheless, they're in a position to kind of speak up and say, "The Emperor has no clothes." . . . So they have an opportunity to be advocates for systems, for groups of children, and some of them do.

Raulston Saul (1995) cautioned that lobbyists with skills could easily gain control of public mechanisms and move aside the democratic elements. Public politics was described as "citizens acting themselves to gain greater control over their future, . . .

citizens working with citizens for the greater public good" (Matthews, 1997, p. 24). It is citizens linking with each other to deliberate publicly, describe important issues, communicate them to "officeholders," and make decisions as to "how to act as a public" (p. 24). It is more than volunteering or participating on advisory bodies. Parents require education and opportunity about multi-modes of public participation. The study participants indicated that lack of time and knowledge and supportive structures currently affect public participation for children. The public participation role in linkage infrastructure is prone to criticism from others and both the public and professionals require purposeful systematic development of linkage skills. The sharing of power is frequently not achieved (child advocate).

All of the study participants advocated for access to knowledge areas and support for childhood. Professionals have an important role to provide resources and ongoing support to increase the family's abilities to participate. Teacher B emphasized, "I don't think that's the parents' job to go and track down government agencies to change the policy. It's virtually impossible"; and the child advocate observed, "Relying on the parent by a professional to be the main school contact may work at times, but there are a significant number of times when it does not." Therefore, fostering the role of public participation and advocacy through linkage strategies must become a much stronger community agenda, according to study findings.

The concept of *social union* is defined as "the web of rights and obligations between Canadian citizens and governments that gave effect and meaning to our shared sense of social purpose and common citizenship" (Biggs, 1996, p. 1). Children are a critical part of Canadian social union that has deep links to economic union. A Canadian Institute of Child Health editorial in response to the Speech from the Throne on September 23, 1997, stated that partnerships for social unity would not be enough for a National Children's Agenda. Governments must provide both leadership and resources to the support of healthy children.

It is very important for Canadians to determine their shared values to help define their Canadian identity (Peters, 1995). Based on 1993 data, Peters found that Canadians value children beyond their productivity as adults. However, this often stays at an abstract level, and Canadians are not sure how to make this a priority in reality. Much

more discussion is needed in Canada to "reconcile the view of the autonomous family with that of society's collective responsibility to promote the well-being of all children" (p. 18). Development of knowledge about networks, legislated bodies, and associations of parents, for instance, is critical to effectively put in place parent/public participation in planning and decision-making processes that affect children, families, and communities.

Ignatieff (2000) highlighted the necessary conflict between rights and democracies because democracies are not always right or fair, and "this tension was essential to the preservation of liberty" (p. 47). He saw the state having an important role in child protection but stated that child protection is ultimately up to communities. Rights protection is meaningless "unless it called forth our civic courage to intervene when we know we should" (p. 96) "Rights create community" (p. 124). It becomes critical to promote a Canadian culture of childhood through strong linkage infrastructure, as an important part of the social and economic union of Canada and of developing Canada's national identity.

Knowledge Sharing for Collaborative Linkage Infrastructure

There are "short-comings in our systems as to accessing information" (child advocate) for children and families, according to all of the participants. There are profound knowledge-sharing needs in children, families, and communities in Alberta; but government and community planning is beginning to develop toward macro-scale linkage. The study evidence indicates that for this macro-scale implementation to succeed, more knowledge about the concept of linkage infrastructure and its outcomes is required. A systems approach to identifying linkage processes and outcomes from a child, family, and community perspective is crucial to expanding the scale of collaboration in the systems. According to Kahn and Kamerman (1992) and Wang et al. (1998), there are two primary areas of knowledge development that are critical:

1. the areas of service integration processes such as organizational and interorganizational processes, political efficiencies, and cost; and
2. child, family, and community outcomes. It is therefore encouraged that outcomes reflect community building and individual support.

The study verified that these two areas are especially noteworthy in developing the concept of linkage infrastructure. Evaluation paradigms are challenging because they

must be able to capture how strategies may produce different outcomes for different children and families (Bruner, 1993). Bruner recommended expanding small community-based services to scale to accurately assess their outcomes. He stated that the understanding of how results are achieved is an important component for the contextual replication and the expanding of scale that is ultimately needed. It was therefore encouraged that outcomes reflect community building as well as individual support. The Harvard Family Research Project (Horsch, 1998) had begun one larger scale evaluation attempt, with nine large projects in different states. The linking of social service and health processes to educational process outcomes was considered very important. They recommended examining a variety of outcomes such as process outcomes, treatment outcomes, prevention outcomes, and developmental outcomes. Hoagwood et al. (1996), quoted in the Alberta Children's Initiative (1999) *Report for Children's Mental Health Initiative*, suggested that research in children's mental health had missed a crucial step by moving directly from laboratory-based treatment efficacy studies to attempts at systematic reform without studying the effectiveness of services in the community environments. It was conceded that this was difficult to do because mental health has multi determinants.

The COPE program of research in Alberta (Clarke et al., 2000) described the importance of human resources for children's mental health to implement school-based recommendations and provide continuity and follow-up. Teams were used to implement the COPE program, which integrated pediatricians and child psychiatrists into service teams in 44 elementary schools in Calgary, AB. The program aimed to increase early identification of need, assessment, and access to resources. The study found improved scores on psychosocial indicators, improved parental understanding of needs, improved physician understanding of the complexities of these children, and earlier and more complete diagnosis (Clarke, 2000).

The American Institute of Medicine's (1997) committee to study school health stated that the outcomes of comprehensive school health programs were not well documented and that outcomes evaluations were complex. Their recommendation called for a major research agenda in this area to establish these programs and study them. The government representative indicated that this kind of research is currently needed in

Alberta. Much more work must be done to understand and promote the building of "educational resilience" in children, which buffers stressful life circumstances and promotes healthy development and learning through building protective factors in schools, homes, and communities (Wang et al., 1998). Standardized achievement tests and attendance are widely used, but documentation of unique outcomes is much too limited (Wang et al. 1997). Few have tracked child and family follow-up.

The study participants indicated that more learning about children themselves in their varying environments, about integrated approaches that achieve desired outcomes, about governance frameworks that are the most effective, and about community strategies that facilitate these and many other vital areas are essential ingredients. The use of information technology by institutions is essential to leverage linkage, research, and educate effectively. The documents indicated that collaborative governance structures are being formed, and these will require accountability. Research is needed in the areas of evaluating practice and outcomes under these frameworks, researching integrative and connecting models, and changing professional roles and fiscal components of these changes. The study conducted by the Canadian Association for Community Care (1997) for their *Report for Children With Special Needs in Canada* found relatively little Canadian information published despite a great deal of use of these services for children. They reported that American literature has focused on specific programs of care because of its market-oriented model. Canada has more of a systems approach and its own way of funding services, so much more research is needed in the Canadian context. There has been little systematic research regarding the fundamental organizational issues such as those described above that have arisen with service coordination, including better understanding of systematic and structured approaches to community relationships to obtain genuine, sustainable results (Crowson & Boyd, 1993; Epstein, 1997; Mawhinney, 1993).

Interprofessional education and partnerships between universities and communities are key pieces in the development of broad-based integrated approaches for children (Nucci & Smylie, 1991). Lawson and Hooper-Briar (1993) described it as "democratization of knowledge and services" (p. 159). The formation of the Community-

University Partnership for Study of Children, Youth, and Families in Alberta is encouraging.

Institutional Factors Within Collaborative Linkage Infrastructure

Much more knowledge about critical organizational issues that pervade institutions and systems and impact collaborative efforts is critical (Crowson & Boyd, 1993). The necessary change within institutions usually involves organizational dynamics such as hierarchical structure, professional preparation, problems with the reconceptualizing of roles, territorialism, and the undervaluing of other roles to make implementation a reality (Crowson & Boyd, 1993). These dynamics are outlined below.

Reconceptualizing Roles

Collaborative processes are the glue that holds the fabric of human linkages together for children and their families. The study participants indicated that collaborative processes are often lacking but are integral to achieving an integrated perspective for children. There are four distinct stages in the continuum of collaboration: communication, which establishes an informal network; coordination, which formalizes a linked network; collaboration, which develops a comprehensive network; and the final stage of community planning, which uses all the resources of a community toward accomplishing a goal (Weiss, 1993). The Harvard Family Research Project's (Weiss, 1993) definition of collaboration contains many institutional elements: "the process of combining and coordinating financial, human, and administrative resources and activities to deliver more comprehensive, coherent, and humane services to children and families" (p. 5). Fitzsimmons and Forbes (1993) described the continuum of collaborative practice as autonomy, parallel practice, consultation, multidisciplinary practice, a holistic interdisciplinary team, shared expertise, and, finally, inter-professional collaboration in which expertise is respected and the complex autonomy of the professional team is recognized. Mawhinney (1993) stated, "Successful interventions depend upon the capacity of a flexible response by professionals who share understanding of the ecological context of the child" (p. 37). It is beneficial for linkage practice for communities to acquire knowledge to understand where they are in the collaborative continuum using the critical institutional context.

Collaboration is very effective but requires a sustained continuous effort and institutional incentives. The collaborative process raises the complex issues of communication, control, and power (Mawhinney, 1993). Policies that encourage collaboration as a fundamental part of large-scale service systems are not yet the norm (Crowson & Boyd, 1993; Harvard Family Research Project, 1992). Study findings indicate that the Alberta Children's Initiative has set the tone for more collaboration and integration, but implementation at the institutional level remains uneven and funding insufficient. Bruner (1991) cautioned that collaboration alone would not solve all of the complexities in the environment that affect children and their families. It does not lessen the need for additional resources for difficult problems and for learning the skills in the art of the collaborative process. There has been a great deal of rhetoric associated with collaboration. As an institutional element, the collaborative process builds consensus and enables linkage for the development of learning communities to support community goals (Senge, 1990).

Hierarchical Structure, Territorialism

The desire for increased participation of both formal and informal institutions, including the family, in linkage infrastructure, was very evident in the study. Barriers outlined were considerable. Powell and DiMaggio (1991) pointed out that the central institutions of contemporary Western societies are family, capitalism, bureaucratic state, democracy, and Christianity. These institutions are "symbolic systems and material practices" (p. 249). In short, from an ecosystems perspective they have both human and non-human elements. Adler (1993) stated that to understand the politics of linking our institutions and services, it must be recognized that children, families, schools, and services are part of different institutionalized networks of organizations (Meyer & Rowan, 1977; Perrow, 1986). Perrow's concept of interorganizational networks is useful in understanding the organizing of community systems. Each service area exists within its own institutional network of organizations. Some of the important structural areas of linkage can be identified through Adler's components within networks, of similar types of organizations: "direct service providers, professional training, public and private funding organizations, professional and union organization, regulatory government agencies, special interest groups and research organizations" (Adler, 1993, p. 4).

The perspective of the school as an institution that activates support to children and families can deeply affect the core structure of the school as a community institution and may generate opposition. Theorists have developed theory on voting and markets, but little work has been done on clearly understanding the mechanism of "how societies and aggregates make collective decisions" (Moe, 1984, p. 739). It involves hierarchy. For many of the study's linkage patterns this mechanism was important in boundary activity. The child advocate explained:

> In terms of our own program, one of the continuing challenges we have with respect to Aboriginal communities is the very concept of what we do, the advocacy. We help young people to be heard, to raise questions if they disagree with decisions. That's very much at odds with values in the general Aboriginal cultural context: Elders are to be respected. Asking children what they want isn't sort of part of the mindset.

Moe acknowledged that balancing tradition and professional discipline with institutional permeability and accessibility is a significant challenge. Sufficient, resourced permeability of system boundaries had not been achieved for schools and other institutional areas, according to study participants. Government sectors were seen as too big and policy often does not work at the child level. "I think the problem with government sectors is they're too darned big. We're dealing with individuals here, and they're writing a policy for a group, so basically it doesn't really work" (teacher B). Canadian authors Lewington and Orpwood (1993) stressed the urgency of reinventing the education system in Canada to soften the institutional boundaries of schools so that school-community involvement is greater, enabling more empowerment and sharing of responsibilities by the community at the school level.

Organizational Dynamics

Many institutional dynamics, both barriers and facilitators, were described in the study. Significant barriers included under-resourcing, lack of linkage expertise, insufficient knowledge sharing, and service-system gridlock. Greater understanding of the dynamics of institutional linkage infrastructure is crucial for successful implementation of collaborative community systems. Alford and Freidland (1991; as cited in Powell & DiMaggio, 1991) depicted the institutional level as a critical bridge that

has "mediated concepts, positions, citizens, and organizations in society and theoretically constructed the symbolic world of society" (p. 242). Institutions were described as "supra-organizational patterns with shared norms" (p. 242). There are three defining processes in institutionalization: imitative; normative transmission of social facts from external sources such as the professions; and coercive, which are important to maintaining legitimacy but are not used in the organization (Zucker, 1987). For example, M's mother felt that to sustain successful linkage, more "normative transmission" of social facts such as from a child health nurse or a school nurse would be helpful to both the school and the family. This picture of organizational processes helps to determine where to "fit" linkages in institutional process for leveraged outcomes.

Decoupling; loosely and tightly coupled systems. Zucker (1987) listed the consequences of institutionalization as maintenance, resistance to change and reduced action, isomorphism, centralization, allocative power, and decoupling or loose coupling. The external valuing and mandating of linkage practice therefore becomes important for encouragement of coordinating linkages because of the institutional characteristic described by Meyer and Rowan (1977) as "decoupling." Decoupling, they stated, protects formal structures such as institutions from strict evaluation and enables coordination and interdependence to be handled informally. The concept of decoupling keeps certain elements at the fringe of the organizational core to decrease organizational commitment. Because coordinating of activities can lead to conflicts and a challenge to legitimacy, decoupling reduces the institutional effort needed for change. Interdependencies are addressed informally only, and skill in this area is valued within the institution.

Crowson and Boyd (1993) advised that simply adding coordinated services to a school does not necessarily result in significant changes within the school or between school and community to benefit children. They maintained that unless the deeper institutional issues that may impede this process are understood, an integrated approach to children and families will not penetrate schools and community life and become a cultural norm. Study participants described parent participation, community partnership, and participation of school councils as usually loosely coupled with schools due to a number of factors, including human and financial resources, the skill or intent of the principal, lack of time, and lack of parental time and interest. According to Herrington's

(1994) analysis of schools, parallel programming may reduce the boundary issues that can occur in more tightly coupled programs, but it does not provide the synergy or the holistic potential of integrated programming that many children need. According to the study participants, many children's needs, including mental health needs, at the front line remain decoupled, and integrated effort does not reach the child in a timely manner. Some children in government care remain "warehoused" (child advocate) within the public system in inappropriate placement due to system gridlock, a form of decoupling.

Meyer and Rowan (1977) argued that the conformity needed by institutions is often preserved by creating a gap and buffering their formal structures from the uncertainties that are in the product end of their actual work. The lack of sufficient depth in the coordinating structures for childhood in the provincial government, as expressed by many study participants, is an example of this dynamic. Therefore, linkage strategies demand collective strategies about the "product outcomes" and a recognition that they must adapt to increased complexity as efficiently as possible but maintain the uniqueness of their contribution. Finding the effective fit of the linkage within community systems becomes essential. Integration for the complexities of children and families demands that the areas of controlled activity move closer together and become more aware of their impact on each other and the outcome product. A system or institution "hunkers down"(child advocate) when resources are insufficient, and decoupling occurs when the common good may be reduced due to institutional self-interest.

In moving from programs to community linkage frameworks, consideration of linkage infrastructure benefits from O'Looney's (1993) description of loosely coupled systems and tightly coupled systems. Loosely coupled systems were defined as "a set of decentralized, independent, uncoordinated organizations interacting as occasion arises but lacking formal ties. . . . Tightly coupled systems involve sets of centralized, independent organizational units acting as a coordinated or collaborative system" (p. 507). Loosely coupled systems are more responsive, promote outreach and innovation, allow for choice, and avoid standardization (O'Looney). Tightly coupled systems are more effective for diffusing technology, service access, equity, and networks and evaluation; and for reducing service gaps. O'Looney stated that most service integration advocates suggest that service delivery is improved if it moves to a more tightly coupled system while still

responding well and with flexibility. The Alberta government's SHIP initiative is an example of a more tightly coupled system. Several participants stated that the Alberta Children's Initiative (ACI) was currently not strong enough. Study findings indicate that linkage expertise to develop tighter inter-sectoral coupling is beginning, but inter-sectoral systems self-regulation has not been achieved because ACI lacks funding and is not tightly coupled enough.

New institutionalism. Crowson and Boyd (1996) advocated significant consideration of the "new institutionalism" in the dynamics of implementation of school-linked services. DiMaggio and Powell (1991) recommended using the stable elements of new institutionalism as starting points in reform strategies. They stated that the concept of "new institutionalism" describes the potential holistic relationship between organizations and their external environments rather than the use of a "boundary-spanning" perspective. The new institutionalism recognizes influences within the formal structure: inter-organizational influences, conformity, and other cultural factors, many being within persons or disciplines (DiMaggio & Powell, 1991). In comparing new and old institutionalism, they saw field, sector, or society rather than the immediate community as how and where the organizational dynamics may actually be structured. Consideration of the new institutionalism helps acknowledge the frustrations of power imbalance, lack of innovation, "irrationality" (p. 79), and persistent replication of institutional agendas. The organizational dynamics of "new institutionalism" were described as "persistence rather than change, identification of forms of cognition as classifications, routines, and scripts rather than values, norms, and attitudes" (p. 13). This dynamic reflects the cohesiveness needed for collaborative linkage infrastructure. *New institutionalism* therefore is conducive to understanding institutional dynamics using an ecological systems perspective. All linkage patterns found in the study identified and reflected elements of new institutionalism.

Isomorphism (DiMaggio & Powell, 1991, p. 79) is the dynamic that replicates institutional script, to contribute to the "institution's formal reason for being." This dynamic may contribute to a lack of power sharing in linkage contexts that many study participants acknowledged as a significant and frequent linkage barrier at the personal and organizational level. Consideration of strategic use of this dynamic is important in

new institutionalism. DiMaggio and Powell hypothesized that the greater the dependence of an organization on another organization, the more alike in structure and climate they become. They found that the greater the centralization of resources, the more change will occur to conform to the organization supplying the resources. Therefore, it is apparent that a high level of mandate for coordinated efforts is required along with joint funding strategies, with standards reflecting this inter-sectoral and community accountability to produce self-regulating community systems (Junek et al. 2000) within institutional scripts. For example, to encourage integrative effort using inter-sectoral institutional scripting, for the Alberta Children's Initiative, the government could fund initiatives only if they showed that coordination and integration were being planned in a cross-sectoral, systematic way. This funding strategy occurs for some initiatives in Alberta (e.g., SHIP).

Organizations are on a continuum, with one end the production organizations with strong control on output and the other end, institutionalized organizations whose success is founded on stability and "isomorphism" (Meyer & Rowan, 1977). These authors stated that as society collectively organizes, its interconnectedness of social concerns takes away the traditional market forces. However, today the major impact of global economic forces on reducing the social structuring of communities, and the inherent risks to families has been acknowledged by many (CICH, 1997; Soros, 1998). With these influences, organizations such as schools and bureaucracies become producers of outputs that are much more difficult to evaluate. The use of linkage patterns found in the study can help mediate the dynamics between critical community outcomes and maintenance of institutional stability.

Scripting is a form of isomorphism. Zucker (1987) emphasized it as an important characteristic of the new institutionalism. It is primarily through the use of deeply embedded routines and scripts within the organization that collaborative ventures can be most successful (Zucker, 1987). Use of scripting is preferred to other current methods of collaboration such as negotiating a balance of organizational interests or finding common vision, goals, and values (Crowson & Boyd, 1996). The institutional environments could bring increased buffering, stabilization, and sustainability for coordinated initiatives (Meyer & Rowan, 1986). Therefore, recognition of the formal and informal networks in linkage infrastructure is very important for linkage implementation that is effective to the

environment at the micro-level. For sustainability of linked support, integration and coordination of effort for children need to become a part of institutional myths that are valued.

The inside/outside linkage pattern (illustrated in Figure 7) is a linkage pattern identified in the study that reflects consideration of "new institutionalism." It appears to be related to Zucker's (1987) contention that the influence of the interconnected networks of relationships inside the organization and independent of organizational boundaries is a significant factor to consider in organizational dynamics. Zucker (1987) explained that both the element of internal organization and the elements facilitating network coherence and interconnectedness act to maintain the existing structure and to encourage change in it. This stability should be considered as a starting point in reform strategies (DiMaggio & Powell, 1991). Recognizing this stabilizing factor and its use in linkage infrastructure is a great strength for implementation of ecosystem integrity for children and youth.

The institutional field must provide permeability and access to help define and clearly recognize inter-sectoral roles. The child advocate offered an example. In First Nations communities who receive delegation from the Province to handle child welfare, there is "no monitoring or standards in place. . . . It's just sort of a hands-off thing, which means that if there are good services or there are bad services out there, it's all a matter of chance." When this difficult area is brought forward "as we frequently do in the system, then people are very quick to sort of shout "racist." Essentially, what's racist about it is that Aboriginal children on reserve often don't receive the services they are entitled to." Determining "hand off" among organizations is a current system goal, according to the government representative. For example, the comprehensive school health approach (CSH) is needed to sustain the results of ESHIP services and promote a healthy school community. CSH has not been developed or funded in most schools, so the linkage infrastructure is often incomplete. Such "buffering" linkage structures that use the inside/outside linkage pattern (Figure 6), such as healthy school community teams at the school level, collective knowledge areas, and more coordinated intergovernmental structures, are either not in place in Alberta or are just beginning, according to the study evidence and M's family.

Recognition of the new institutionalism is a critical element to achieve inter-sectoral self-regulating systems for childhood using community linkage infrastructure. It is an important argument for the critical linkage goal of sustaining a cross-sectoral bureaucratic mandate, the Alberta Children's Initiative, to initiate, change, and sustain integrated approaches for children and youth. The following Alberta statistics illustrate community need. The population of Alberta has increased by 19% in the last 10 years. Children's Services sector spending has risen by 232%. Child Welfare caseload has risen from 8,000 to 15,000, a 99% increase (*Edmonton Journal*, Nov. 23, 2001). The number of children in government care or receiving help from child welfare was up 9% to 15,052 in September 2001 from 13,836 in September 2000 (*Edmonton Journal*, Nov. 20, 2001). Therefore, consideration of the dynamic of new institutionalism is important in picturing the work of linkage patterns with goals to support ecosystem integrity (Figures 5, 6, and 7). This institutional dynamic helps linkage work to address diversity and complexity within individual communities with linkage to larger systems as the ultimate goal.

Discussion Summary

Study findings indicate that on the collaborative continuum (Weiss, 1993), Alberta community systems are generally at the level of coordinated linked networks, with some work beginning toward collaborative comprehensive networks (e.g., SHIP). The final two stages of the collaborative continuum, those of developing comprehensive networks and developing full community planning, remain to be developed in Alberta. Understanding the linkage dynamic of the *new institutionalism* is critical to achieve linkage patterns that reflect the polycentric realities of societies today that use local innovation and attempt diffusion of knowledge. This is supported by study findings. Successfully implementing the linkage dynamic of new institutionalism provides buffering and stabilizing effects to benefit the ecosystem for childhood. The theory of linkages for healthy childhood (Table 3), as proposed in this study, describes linkage patterning that conveys structural integrity and the healthy abilities (adapted from the abilities of ecological integrity) within the four levels of the ecosystem. In this way ecosystem integrity (ESI) and health, developed from ecological integrity (EI), occur for childhood (Figure 3). Recognition of these influences is important for healthy child development and for preparing and educating those who work and live in the more

integrated and interdisciplinary community environments of this century. Without it, the risk of failed initiatives and gaps in children's lives remains.

Discussion Conclusion

The theoretical model of ecosystem integrity proposed in the case study was verified by study findings. Ecosystem integrity (ESI) as an extension of Westra's (1998) philosophy of ecological integrity (EI) is needed to protect and nurture childhood. Developing the understanding of human inclusion within the concept of ecosystem integrity (ESI) is critical to attaining the important goals of ecosystem integrity developed from EI for childhood.

Researching ecosystems complexity using this case study's systems method was successful. It operationalized the proposed theoretical framework of the case study, documented complexity, yielded rich data, and can be used to replicate data in other contexts or age groups. The extensive document analysis reflecting the work of many sectors, as well as the purposeful inclusion of conversations with key informants in the field eminently qualified and at a sufficient level within the systems to speak regarding the context of M and of all children, increased the depth and breadth of systems studied and increased the study validity for all children in Alberta at this time. The policy context and the individual context are often studied separately. The data verify the value, importance, and feasibility of considering the policy context in relation to the individual context despite the complexity. The study findings support both theoretical generalization (Figures 3 and 4) and naturalistic generalization to Alberta community contexts for childhood (Figures 5, 6, and 7). This perspective helps support interaction between research and practice. The systems method used in the study advances the methods for researching the complexity of ecosystems. It develops a trans-disciplinary approach for systems research beyond traditional boundaries of method and linear approaches. Trans-disciplinary research is a mode of knowledge development that uses the context of knowledge application (Van Manen, 1999). This case study exemplifies the feasibility of attempting further knowledge development using the context of systems within the ecosystem for childhood.

Both Westra's and Bronfenbrenner's theories describe a state of convergence without artificial barrier of ecological elements within ecosystems. This case study finds

that further research to describe this state of convergence is essential to contribute to the understanding of ecosystem integrity (ESI), ecological integrity (EI), and their abilities. Further suggestions for research include context-based research using this piloted systems method in schools and early childhood sites to describe linkages and their outcomes at the child, family, and environmental community levels that creates healthy environments for all children, including those with specific health/learning conditions. To prevent underestimation in the child, more research is needed that describes molecular biological outcomes of the contributions of professionals and community environments toward specific childhood conditions. In this way further essential development and recognition of the indicators of ecosystem integrity (ESI) as an extension of EI for childhood can be undertaken. Greater community expertise in sustained linkage, bearing in mind the new institutionalism and using transforming, knowledge-based cultures to give nimble, adept, creative linkage abilities, is crucial to the continuum of response that creates healthy abilities in children, families, communities, and other natural systems.

CHAPTER VII

RECOMMENDATIONS FOR THE IMPLEMENTATION OF ECOSYSTEM INTEGRITY FOR CHILDHOOD

The following section makes recommendations for community practices that use the linkage patterns in study findings as part of ecosystem integrity to contribute to healthy abilities in children, families, and communities. Community linkages to achieve this goal take "political courage" (child advocate). Study participants indicated that the presence of linkage infrastructure for childhood has the potential to vastly increase proactivity, make these processes of engagement easier for communities, and create group accountability. The recommendations arise from the four major areas that contribute to linkage infrastructure for childhood, as discussed in this study: service integration, health-learning linkages, public participation, and knowledge development and sharing. Some of the institutional dynamics that may occur in the recommendations are listed in parentheses.

1. Implement community linkage infrastructure directed at the healthy abilities of ecosystem integrity at the micro-, meso-, exo-, and macro-levels of the ecosystem to convey protection against vulnerability and to promote health (Figures 3 and 4).

- Form an inter-sectoral executive governmental body to sustain the Alberta Children's Initiative to promote the development of inter-sectoral initiatives within the province, as well as inter-sectoral policy and research. Through this integrated linkage structure, the planning and promotion of other comprehensive government initiatives for childhood can develop. It creates a single "locus of responsibility; . . . effective policies require aggregate responsibility" (Shonkoff & Phillips, 2000, p. 414).
- Direct supportive linkage infrastructure toward sustaining the healthy abilities of ecological integrity in children, families, institutions, and communities. Develop inter-sectoral provincial and regional policy for childhood that leverages linkage abilities according to an adaptation of the Precautionary

Principle (Westra, 1998). Focus on protection of children/youth and "making disease work in healthy living" (physician A).

- Embed the provision of linkage infrastructures according to effective patterns of linkage in inter-sectoral policy, research, practice guidelines, service systems, and community practice.
- Use these patterns of collaborative linkage infrastructure to efficiently move larger initiatives to the child, family, early childhood, schools, and community environments to implement macro-scale outcomes of linkage practice.
- Encourage and respect "political courage" (child advocate) by professionals and communities to protect children and youth and promote the healthy abilities of childhood.
- The systemic changes required were to redirect existing funding streams, develop new core funding including broader categorical funding, increase authority of those working directly with child and family to make decisions, establish internal linkage process so staff can identify a continuum of care, clarify roles and educate about them, provide time and authority to collaborate, and develop new standards of accountability (Behrman et al., 1992) (*new institutionalism*).

2. Fund the sustainability of ecosystem integrity according to linkage patterns that promote the healthy abilities of childhood.

- Effectively invest sufficient budgeted resources in public systems, which is an important element in sustaining linkage networks and preventing "hunkering down" (child advocate) within sector boundaries, producing institutional and community stress.
- Develop the Province of Alberta's Alberta Children's Initiative by setting aside a stable endowed fund for childhood that will deliver long-term sustained funding to a balanced strategy of community initiatives. Develop inter-sectoral provincial and regional business plans as leveraged linkers. Fund the regional community plan for childhood for each region, to bring services and preventive approaches to communities. Direct sustained funding

toward proven effective collaborative linkage infrastructure, to prevent collaboration from becoming too expensive in time and resources.

- Bring together an endowment fund for applied research for childhood as recommended by the Children at Risk Task Force (2000).
- Increase the linkage abilities of child health service areas, schools and early childhood centres, and neighbourhood child and family centres by funding critical linkage positions and the support for linkage practices as the facilitators of linkage to capture synergy.
- Develop commitment for funding the non-medical determinants of health such as early childhood support and comprehensive school health. Implement the linkage infrastructure to achieve these goals to contribute to ecosystem integrity.
- Develop school and early childhood site-based budgeting that brings effective joint funding from other sectors to the school to address health/learning needs and sustain a healthy school community.
- Fund professional and community practice that develops constructive linkage to complementary structures such as service hubs or knowledge networks.
- Develop more flexible funding formulas that support the individual child in early childhood and the school years. This funding should encompass their "whole needs" (including health/learning needs) within the micro-system. Add these funding formulas to the current system's formula's of block budgeting, which aims for the meso-system level.

3. Establish joint accountability across sectors and within the community.

- Establish regional co-terminous boundaries for the Health, Children's Services, and Learning sectors to enable efficient, collaborative linkage for cross-sectoral initiatives with joint accountability.
- Develop inter-sectoral provincial and regional community system action plans to develop collaborative linkage infrastructure to reach children in their micro systems, families, and communities. Otherwise it may be assumed that action is being carried out when in fact it has not (*prevent decoupling*).

- Link accountability frameworks across sectors at the regional and provincial levels according to regional community plans.
- Aim for cohesion among community systems as a linkage goal, rather than coherence.
- Develop a regional inter-sectoral human resource plan based on the regional community plan for childhood that includes both early childhood sites and schools (e.g., positions in Child Health ambulatory areas that provide easily accessible, ongoing support and link with the school and early childhood service teams who help sustain healthy school communities by participating in the healthy school community action teams at the school level). Children's services teams from the neighbourhood child and family centres would also link with these teams.
- Implement intentional linkage structure and processes for regional structures to meet as provincial groups (e.g., regional authorities) and site-based linkage structures (e.g., school councils) to meet as regional groups (e.g., formation of councils of school councils, COSC) to learn from each other, promote equity, and develop synergy.
- Implement broader communication processes within and across government ministries with responsibility for children, to improve visibility of initiatives that are in planning or being carried out, and to improve awareness in the field of progress toward inter-sectoral goals for children, families, and communities. Develop accountability for these processes.
- Develop public-private partnerships for childhood to complement and learn from each other.
- Share responsibility between professionals and parents to ensure that there is a plan of portable, linked support in place to address the needs of the whole child. Leverage linkage by combining inter-sectoral professional support and public participation.
- Implement a reporting role for the Office of the Children's Advocate to the Legislature.

4. Implement the interlinked concept of health/learning in childhood.

- Through the inter-ministerial executive linkage in the Alberta Children's Initiative, implement the elements of comprehensive school health in all schools and early childhood centres so that these institutional environments become leveraged linkers for societies.
- Implement a specific health/learning link in policy, institutional activities, resources, knowledge-sharing activities for the school, early childhood areas, and the family. Use balanced linkage strategies to address vulnerability, as well as the sustainability of community support.
- Consider the dynamics of the "new institutionalism." Use linkage infrastructure to enable schools to develop as knowledge organizations to help respond effectively to school-community needs. Develop collaborative learning cultures through collaborative teams, community advisory processes, linkage to knowledge sources about childhood, intra-sectoral and inter-sectoral linkage, inclusive processes, and the valuing of innovation and continuous learning.
- To *prevent decoupling* of health/learning support to children and youth from the school as a public institution, develop each school and early childhood community as a vehicle to promote healthy abilities in the child, the school, and the community.
- Implement more detailed policy in schools for preventive linkage practice to provide safe classroom environments to care for children with asthma, allergies, and other health challenges and provide easy access by students to their medication.

For optimum implementation of healthy school communities, the following linkage infrastructure is required to be embedded in the "institutional script" to bring these linkage goals within the institutional agenda:

- Use the regional and provincial steering groups for Student Health Initiative Partnerships, to develop their service mandate to include implementation of the known elements of healthy school communities (Marx & Wooley, 1998) to sustain the SHIP services already brought to some school environments.

- Develop linkage interface at schools and early childhood centres by implementing a healthy school-community team at each site that includes the principal and representation from the school interdisciplinary service team, school staff, student body, school council, and community partners.
- Promote the development of strong school councils and student councils.
- Integrate curriculum and link community education goals to it (e.g., fetal alcohol initiative, integrated processes for learning).
- Develop learning partnership with parents using Epstein's (1995) processes of parental involvement for schools.
- Increase linkage practice at the regional level and the school-site level to develop community partnerships for schools and early childhood centres (*isomorphism*).
- Implement regional relationships among school councils by forming councils of school councils connected to regional boards and provincial MLAs. Implement regular process among regional school councils and the public councils for regional Health and Children's Services Authorities.
- Develop pools of inter-sectoral resources about healthy school and early childhood communities through the Alberta Coalition for Healthy School Communities (ACHSC) and CUP.
- Use these linkage structures to facilitate the effective, efficient implementation of government initiatives for children and youth in schools and early childhood areas, in a way that is meaningful to each school community (SHIP, AISI, Children's Mental Health Initiative; Figures 5 and 6).
- Through leveraged community structures such as ESHIP, link early childhood linkage practice to school-community linkage practice.
- Direct the development of linkage practice for early childhood to address the following barriers described by the American Medical Advisory Committee (Shonkoff & Phillips, 2000) and verified by this study: lack of quality and choice of early childhood care; poverty; lack of rigorous evaluations of program implementations; lack of documentation of causal relations between

specific interventions and specific outcomes, of mechanisms of change, and of cost/benefit analysis; fragmented early childhood policy; confusing points of entry; lack of integrative early childhood infrastructure; research practice geared to program funding rather than the promotion of continuous improvement; and professional development challenges.

- Promote inter-sectoral responsibility for the early childhood years through executive linkage in Alberta Children's Initiative for health in early childhood. Establish institutional support rather than merely a series of early childhood programs; use epidemiological tracking of early childhood years, equity of access, and sustained linkage.
- Develop early childhood and parenting support centres (Mustard & McCain, 2000) that use school-community linkage practices as described above.
- Connect the Healthy Families program to early childhood sites and to regional health and children's services sectors.
- Work with governments, authorities, and community and corporate linkage to bring early childhood support and after-school programs to areas of need.
- Establish school-linked services that are not dominated by any one institution, either the school or health or social services areas, and that do not seek to control the planning or governance of services (Behrman et al., 1992). They must become characterized by shared power that is also inclusive of parents (new institutionalism).
- Educate professionals and parents about health/learning outcomes in the child (Levine, 2001).
- Develop sustained provincial Learning and Children's Services linkage with the federal health sector to commit to wholeness for child health for the early childhood and school years. Coordinate policy at the institutional, regional, provincial, and national level using the institution of the school. With First Nations and Aboriginal issues, "First Nations government, the province, the federal people, and then the various federal ministries and the community" (government representative) are needed to link constructively.

5. Implement service hubs within each sector that contribute to a primary, secondary, and tertiary inter-sectoral continuum of community linkage.

- Develop service hubs in each sector to become leveraged linkers within and across community systems for childhood (e.g., early childhood and parent support centres; Mustard & McCain, 1999), schools, child health ambulatory and tertiary areas, neighbourhood child and family centres (*new institutionalism*). Develop these pools of coordinated services and supportive linkages to become parts of inter-sectoral (including public) networks for service, education, research, and knowledge sharing. Include community service teams with access to schools and early childhood sites to facilitate supportive networks for children, families, and communities.
- Enable portability of the child/youth's care plan across sectors.
- Provide at least one significant, positive, sustaining relationship in the micro ecosystem of each child.
- Implement interdisciplinary service teams, including mental health, for all vulnerable children, including children/youth in protective custody and foster care. Provide accessibility of these teams to schools and early childhood areas.
- Because service hubs in each sector require linkage positions to coordinate within the sector and to link cross sectors, include a linkage facilitator position for the Community-University Partnership for Study of Children, Youth, and Families to encourage linkage and knowledge sharing.
- Through community process, develop clarity as to where to position linkage structures for optimal outcomes to prevent decoupling of linkage. For example, should the structure work from an intra-sectoral position or an inter-sectoral position?
- Use linkage structures with goals of combining inter-sectoral professional practice with public/community practice.
- Implement excellence in linkage practice with Aboriginal community services for children/youth. Link them to major service hubs in each sector to support the delegation of services and the preparation, ongoing support, and monitoring of services.

- Increase the scale of linkage practice in public systems to provide linkage ability to promote depth of support beyond the assessment phase, where needed. This avoids the phenomenon described by Jardine (2000) in which the tempo of integrative processes (e.g., curriculum integration) may be too fast, lack depth as in many places in our society, and result in "the acceleration . . . of the accumulation of thin co-present surfaces" (p. 73).
- Develop effective linkage practice to address areas of need that may be much less visible such as poverty, environmental problems, asthma/allergies, mental health (*new institutionalism*).
- Facilitate portability of support in meso-system level policy to efficiently move support systems of children and families between micro-system environments (e.g., the ability to have homecare personnel move with a child from home to hospital; the equity of access to drug funding when drugs are given at home, rather than in hospital institutions).
- Implement collaborative linkage structures to form meso-level "institutional wrap" for formal and informal institutions such as the family, school, early childhood area, child health clinics, and neighbourhood child and family centres. In the "wrap" use an ongoing balanced strategy of linkage to address immediate needs and promote health.
- Develop effective linkage practice to cover transition periods in childhood such as transition of vulnerable young people experiencing longer periods of adolescence beyond the age of 18 years, as well as those adolescents who have lacked compliance to other institutional or system rules. Implement linked support to form alternative supportive programs needed when a student cannot handle the regular school environment.
- Use interdisciplinary linkage across the primary to tertiary continuum of care to maximize the use of differing levels of expertise.
- Provide options for children and youth within the community institutions to prevent system gridlock for them. In the child welfare system increase the placement options for children and youth when receiving them and provide

effective supportive environments in foster homes, treatment foster homes, and group-care and residential-treatment facilities.

- Develop regional and provincial linkage maps for communities to achieve the linkage goal of portability across ecosystem levels to reach the microenvironments of the child in the family, school, or community.

6. Implement linkage infrastructure that strengthens public participation within community systems.

- Encourage the sustaining of advocacy for childhood by regular intentional linkage process of parents with public systems and institutions, and in government initiatives to communicate needs and plan support.
- Encourage the public "voice" to strengthen public systems and prevent exit. Develop public participation and advocacy in all community systems. Promote mentoring and advocacy programs in each region by developing public participation.
- For public systems, develop and implement board, authority, and institutional policy (school boards, child health areas, schools, children's services) that implements systematic process to encourage public participation.
- Develop guidelines for parent/public participation in all sectors with responsibility for childhood.
- Provide education and resources to inter-sectoral public councils. Provide resources through systems and institutions to strengthen public and parental abilities to advocate need and participate in community planning for children, families, and communities.
- Implement linkage process among public participatory structures, including school councils, health councils, and children's services councils.
- Link school councils to each other and to their regional school board by implementing councils of school councils (COSC) at each regional school board level. Connect COSCs to their provincial Member of the Legislative Assembly (MLA). Develop networked provincial linkage among all school councils.

- Develop inter-sectoral linkage process between regional health councils, school councils, and children's services advisory councils.
- Link public participation structures to the CUP network to communicate need and to participate in community planning and knowledge sharing.
- Develop a province-wide parent network in the province that connects to CUP. Include Alberta Home and School Councils Association, public education advocacy groups, school councils, health and children's services councils, and parental associations for children experiencing health challenges. This network would facilitate a knowledge-sharing linkage to a "public voice" for childhood for CUP and for other regional and provincial initiatives.
- Develop a provincial student council.
- Through education about linkage practice, encourage "receptivity" and prevent "revictimization" (child advocate) of parents/public when opinions and needs are brought forward to public systems. "Collaboration is the creation of a synergistic alliance that honours and utilizes each person's contribution in order to create collective wisdom and collective action" (Hills, 2001, PowerPoint presentation).

7. Develop guidelines and standards for integrated community systems practice.

- Embed the provision of linkage structure that promotes the healthy abilities of EI in research agendas, policy, practice guidelines, and community practice.
- Implement linkage practice supporting ecological integrity for childhood as part of the "institutional scripts" of community institutions to reach the micro-system of the child. It "must be more than bridging" (government rep). This requires collaborative inter-sectoral policy linkage; accountability for linkage practice; needs-based budgeting; flexible, categorical funding; and time built into the institutional "script" for the development of collaborative learning cultures (*scripting*).
- Cultivate the two linkage goals of "receptivity" (child advocate) and proactivity into formal and informal institutional "scripts" in all community systems. "Receptivity" is the dynamic of respectful interaction and careful

listening as a cornerstone of human and non-human inter-relationships which develops trust, prevents underestimation of needs, and promotes boundary permeability among ecosystem elements. Receptivity develops proactiveness in family, institutional, and community interrelations to acknowledge the needs and promote the abilities of health in childhood at all ecosystem levels.

- Develop and implement guidelines for interdisciplinary and community linkage practice that will provide "wrap-around support" for the child, families, institutions such as schools, and communities. Include guidelines for public participation.
- Develop inter-sectoral standards for core services and for inter-sectoral practices as a crucial facilitator of intra- and inter-sectoral linkage and to counteract decentralized models now used in site-based management of schools, child welfare services, and the creation of the Child and Family Services Regional Authorities.
- Develop and enforce uniform provincial standards of care for core services, including criteria to ensure careful screening of foster parents. Work with the provincial and federal governments to provide accountability for all children in government care, including those in First Nations communities where First Nations agencies are funded by the federal government (child advocate; Shonkoff & Phillips, 2000; *iso-morphism*).
- Develop policy in all school boards that promotes public participation and integrated interdisciplinary support for all students (*scripting*).

8. Develop self-regulating community systems (*new-institutionalism*).

- Aid intra-sectoral linkage in helping individual systems to become self-regulating. It is also a critical linkage goal for collaborative inter-sectoral community systems to become self-regulating (*isomorphism*).
- Develop a "self-regulating service delivery system for all children and youth," which was cited as a critical need by the subcommittee on self-regulating systems for the Canadian working group on the mental health and well-being of children and youth (Thompson et al., 2000). They described the need for a system of care for children, rather than separate organizational components,

because most existing systems of care "are not true systems but collections of services" (p. 10). They noted significant barriers: the absence of indicators of child health; few external system incentives for efficiency and improved outcomes; no "executive component that can cause the whole system of care to decide, act upon and implement coherent action" (p. 9); difficulty distributing resources among service deliverers and prevention of disorder and promotion of wellness; and complex internal processes in provincial and territorial governments that add to complexity to navigate. They proposed a self-regulating service delivery system model based on living systems composed of the dynamics of decisions, actions, outcomes, measures, evaluation, feedback, incentives, and rewards.

- Aim for cohesion as a linkage goal rather than coherence. With cohesion there must be trustworthy communication, or deep rifts producing gridlock may develop.

9. Implement a community research agenda that supports the implementation of ecosystem integrity for childhood.

- Develop research agendas that address the following research deficits: lack of rigorous evaluations of program implementations, lack of documentation of causal relations between specific interventions and specific outcomes, lack of mechanisms of change and of cost/benefit analysis, research practice aimed at program funding rather than the promotion of continuous improvement, and the challenges of professional development. "Comprehensive research programs that integrate efforts to understand development with efforts to change it are even more unusual" (Shonkoff & Phillips, 2000, p. 403). These barriers have been confirmed in this study for early childhood and school-age years.
- Implement long-term epidemiological-based research and evaluation of Alberta's children that includes community systems as well as natural environmental systems. Develop a regional and provincial research agenda using multiple research methods, according to the community care plan for childhood.

- The linkage goal of continuous learning will "require a redefinition of time frames from immediate to long term for data management" (Weiss, 2001, n.p.). Community funders and the public must come to understand how to support this continuum of improvement (Weiss, 2001, n.p.).
- Research ecosystem structures, and processes and outcomes of community linkage patterns that support ecosystem integrity and healthy development of children, families, and communities, from the perspective of the child, the family, the organization, and the community levels.
- Link community, professional, and basic sciences knowledge networks. Develop a research agenda through CUP that interrelates the social sciences with molecular biological and medical sciences research to increase knowledge development for evidence-based practice about the bio-physiological implications of community interrelationships for childhood. In Alberta, link the proposed U of A Life Sciences Institute to CUP to further develop inter-disciplinary and trans-disciplinary knowledge; that is, integrated knowledge development across disciplinary fields (Canadian Health Services Research Foundation, 1999) and community knowledge.
- Implement research to develop knowledge about linkage mechanisms that create transformative linkage infrastructure around families, schools, early childhood sites, and other community areas to support ecosystem levels and to address biophysiological vulnerabilities of childhood using an adaptation of the Precautionary Principle (Westra, 1998). According to Behrman et al. (1992), little is known about which governance structures are effective in overseeing school-linked services and best promoting its goals, but ultimately they must be defined by community needs (*new institutionalism*).
- Develop more knowledge about the linked concepts of health/learning and their implications in the child, family, and community. Develop site-based research programs through CUP that use research within early childhood sites and school sites that promote positive linkage and healthy school communities. The American Medical Advisory committee stated, "Comprehensive research programs that integrate efforts to understand

development with efforts to change it are even more unusual" (Shonkoff & Phillips, 2000, p. 403). More descriptive, qualitative, and quantitative research is needed due to the "evolving nature and imprecise measurement of the concepts of 'coordinated,' 'community based,' and 'family centered'" (p. 366). None of the studies reviewed by the National Research Council Institute committee (Shonkoff & Phillips, 2000) emphasized the importance of the mechanisms of linkage within the community systems that brought desired community outcomes.

- Research the contributions of large government initiatives such as SHIP, AISI, and the Children's Mental Health Initiative as elements in this research to develop continuous learning to contribute to clarity in the goals of these initiatives. Link this research to other regional, provincial, and federal research.
- Share research knowledge about practices using knowledge networks such as CUP.

10. Implement interdisciplinary and community knowledge sharing about ecosystem integrity for childhood and the healthy abilities of children, families, and communities.

- Using the Community-University Partnership (CUP), develop closer linkage between university and college programs, and community environments for a greater depth of educational experiences about the ecosystems of children, families, and communities.
- Increase the development of interdisciplinary and community educational opportunities about childhood. Give wider public and professional access to speakers who may ordinarily address a certain professional, academic audience.
- Through university and college curriculum, continuing education, and professional standards, increase the expertise of professionals in linkage practice, in knowledge of linkage patterns and their outcomes that support the ecosystem and healthy development of the child, and in understanding the linked concepts of health and learning. Implement criteria for institutional

leaders in Health, Learning, and Children's Services to develop skill in interdisciplinary and community linkage practice.

- Teach collaborative skills including empathy, communication, listening, validation, negotiation, and conflict resolution through access to community learning opportunities during early childhood, school-age years, professional preparation, and community participation to promote collaborative community systems in society.
- Educate institutional leaders, professionals, and the public about the implementation of comprehensive school health in schools and early childhood areas and the implications of the linked concept of health/learning.
- Educate inter-sectoral public councils (e.g., school councils, health councils, children's services councils) to increase public knowledge about linkage patterns and their outcomes that create a healthy ecosystem for childhood.

11. Develop knowledge-sharing abilities within the community systems. Develop CUP as a locus of responsibility for knowledge sharing (Mustard & McCain, 1999).

- Develop CUP as a macro scale leveraged linker for sustainability of efficient linkage patterns to bring policy makers, educators, researchers, practitioners, and the community closer to community realities, to help determine community roles and responsibilities, and to research how professionals and communities combine their knowledge bases to support healthy childhood (*decoupling, new institutionalism*).
- Using CUP, enable equitable access to knowledge about childhood.
- To delineate a picture of what services, supports, funding sources, and other knowledge are available, develop CUP as a provincewide integrated source of knowledge to facilitate access to services and supports and knowledge of childhood to children, families, professionals, and communities.
- Use the participatory approach to help community partners, including families and children themselves, to have ownership and involvement in knowledge sharing at many levels to help direct changes according to their needs.
- Proactively give information to all new parents when their child is born about this source of support that is easily available to them throughout childhood.

- Through linkage, maximize opportunities for children, families, and communities to support each other. Develop collaborative linkage infrastructure along with collaborative learning cultures, according to supportive linkage patterns. Currently, an important area of need is learning more about the mechanisms and the characteristics of the interrelations among family, community, practitioners, policy makers, educators, and researchers that will facilitate constructive knowledge sharing and promote a climate to have practice "stand up to scrutiny" (child advocate).
- Commit government and community funding to research best practices, including those for community linkage that bring healthy abilities to children, families, and communities.
- Implement inter-sectoral institutional ability to use multiple modes of knowledge sharing (e.g., within the school community, include the use of the Internet technologies to promote home and school learning partnerships, connect schools with other community areas, connect school councils to each other and to other public councils); use multiple modes of knowledge sharing about childhood from child health clinics.
- Develop linkage structures that are leveraged linkers for networks along with the skills and resources to bring networks themselves together and to develop coordinated pools of expertise to achieve linkage goals. Link such networks of expertise, including those of community public practice, to develop an "oasis of knowledge." Current examples of knowledge networks that require further development are CUP and the Alberta Coalition of Healthy School Communities (ACHSC). The power of networks for large-scale linking is emphasized by Oliveria and Tandon (1997) who describe networks as very adjustable, "in contrast to the international mechanisms created by corporations and governments, networks tend to operate horizontally, their centres are everywhere, their peripheries nowhere" (p. 44). They are not integrated under power structures but retain the ability to relate, practice cohesion, and renew knowledge within service and community systems. The linkage structure becomes flexible, effective, dynamic, and resilient.

- Develop and share knowledge about efficient linkage patterns in the ecosystem that support healthy development. Develop the ability to disseminate collaborative knowledge from many areas, including schools and early childhood areas, and other inter-sectoral service nodes, academic networks, policy networks, community networks, public councils, and association networks. Develop CUP to enable access to knowledge about services and supports for childhood from almost anywhere, to help overcome barriers, bridge knowledge gaps, and promote equity.
- Share knowledge. Blake (2001) stressed the importance of demonstrating value to all involved beyond cost issues, to build connectivity. For issues with breadth, there must be a coming together of large areas, without one interest group driving the process and risking failure. He stated that knowledge sharing using technology, such as e-health, faces a great challenge because of the necessity of the adoption of standards. Blake described a movement away from more traditional electronic networks with electronic data interchange toward the use of Internet or web-based standards for implementation of various solutions. In other words, such linkage strategies would become a form of sharing evidenced-based practice.

12. Develop national level indicators of ecosystem integrity for childhood.

- To develop the expertise in linkage practice, develop indicators as tools for sectors and communities to determine what the sustainability of ecosystem integrity in ecosystems "looks like" and what outcomes it generates. Use these indicators as tools to contribute to societal accountability for linkage infrastructure and healthy childhood.
- A standard set of indicators was called for by health ministers in the report *Investing in Early Childhood Development* (Federal/Provincial/Territorial Advisory Committee, 1999). Include the state of linkage within ecosystems such as that "wrapping" families, early childhood sites, schools, child health areas, and regions as part of this standard set of indicators. This state of linkage is an indicator of ecosystem integrity and healthy development in

children, families, and communities. It is key to determining supportive healthy abilities in children, families, and communities.

- Add the state of ecosystem linkage and its outcomes to Canada's Social Indicators. Promote recognition of the indicators of ecosystem integrity developed from ecological integrity, and of healthy childhood. Include such indicators in targets for regional, provincial, and federal business plans.

13. Develop linkage abilities in societies that balance rights and responsibilities for children, families, and communities.

- Develop vision and skill in linkage practice to enable the balancing of the rights and responsibilities of the child, family, and community. Implement increased learning opportunities including for children themselves about the rights of children, families, and communities to enable wise community decisions and practice.
- Teach children about their rights and proactively provide knowledge to them about their conditions and circumstances using age-appropriate language and different modes of communication throughout community institutions.
- Increase compliance with the UN Convention on the Rights of the Child through the statutes in Alberta legislation. Pellat's (2000) review of Alberta's legislation to determine how it measures up to the UN Convention on the Rights of the Child found that for individual children, only the Child Welfare Act includes an overriding provision of the best interests of the child. Yet the consideration of the best interests of the child was a central tenet in the provincial government's agenda for children. None of the statutes in Alberta legislation directed that programs be administered and resources allocated in the best interests of children. Consideration for the views of the child was also not fully respected in the Child and Family Services Act, because children receiving services outside of Child Welfare did not have an advocacy and complaint process through the act (Pellat, 2000).

14. Develop linkage tools—for example, the successful systems method piloted in this case study—to manage the complexity of childhood ecosystems.

- Use an ecosystems perspective in professional, interdisciplinary, and community practice as an incentive for linkage and to achieve sustainability of linkage patterns that promote healthy outcomes such as those detailed as important government goals by the government representative: investing in the early years, promoting family and community strengths, and closing the research-to-practice gap. Add the effects of other natural systems to develop a more complete knowledge about ecosystem integrity and ecological integrity (EI) for childhood (*new institutionalism*). A successful systems method was piloted in this study. Consider its use to help manage ecosystem complexity, to assist knowledge development, and to contribute to clarity.
- Navigate the complexity of the particularities of environment, using a vertical (intra-sectoral) and horizontal (inter-sectoral) perspective, to create the ability for support to reach the presence of the child. Develop linkage maps to guide community linkage according to micro-, meso-, exo-, and macro-levels of the ecosystem (Figures 3 and 4).
- Navigate the particularities of the ecosystem by developing knowledge about the community landscape and the linkage infrastructure (structures, processes and outcomes, barriers, facilitators of linkage). Develop knowledge about community needs, assets, and incentives for linkage infrastructure needed to reach the micro-systems of children/youth. Take research demonstration programs to a larger scale. Research and educate about the linkage infrastructure such as that present and proposed using the Alberta context (Figure 4). Preserve ecosystem integrity at each level of the ecosystem to preserve its sustainability and "self-organizing" abilities"(Westra, 1998, p. 32; *scripting, isomorphism*)
- Recognize that successful linkage patterns do not mean that such entities form aggregates only. Rather, they refer to the ability to achieve strength of particularities to accomplish many goals efficiently, increase public participation and knowledge sharing, and prevent "gridlock" (child advocate). These patterns strengthen individual elements, which in turn can strengthen communities.

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APPENDIX A

LIST OF DOCUMENTS; DOCUMENT TEMPLATE; GUIDING INTERVIEW QUESTIONS FOR PARENT, PROFESSIONALS, COMMUNITY MEMBER, CHILD; INFORMATION LETTERS

Table A

List of Documents Analyzed

Sector	Document
Provincial government and stakeholders	
Learning	Alberta Learning. (1995). *School councils handbook* (rev. ed.). *Meaningful involvement for the school community* Edmonton: Author.
	Province of Alberta. *School Act: Section 17.* Edmonton: Author.
	Alberta Learning. (1998). *School Act* (Consolidated 1998).
	Alberta Learning. (1999). *Supporting safe, secure, and caring schools in Alberta.* Edmonton: Author.
	Alberta Initiative for School Improvement Education Partners Working Group, (1999). *Alberta Initiative for School Improvement administrative handbook.* Barrhead, AB: Learning Resources Distributing Centre.
	Alberta Initiative for School Improvement Education Partners Steering Committee, (1999). *Framework for Alberta Initiative for School Improvement.* Edmonton: Alberta Learning.

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Sector	Document
Learning (cont'd.)	Alberta Learning. (2000). *Shaping the future for students with special needs: A review of special education in Alberta final report.* Edmonton: Author.
	Alberta Learning. (2000). *Alberta Learning 2000-03 business plan.* Edmonton: Author.
Health	Alberta Health and Wellness. (2000). *Ministry of Health & Wellness: Three-year business plan, 2000-2003.* Edmonton: Author.
	Health Canada. (2000). *Alberta Primary Health Care Project from Health Transition Fund: Advancing primary health care in Alberta.* Ottawa: Author.
Children's Services	Alberta Family and Social Services. (1998). *Provincial accountability framework for child and family services authorities.* Edmonton: Author.
	Alberta Children's Services. (1999). *Alberta partnership on fetal alcohol syndrome.* Edmonton: Author.
	Chan Durrant Ltd. (2000). *A review of the Office of the Children's Advocate.* Edmonton AB: Alberta Children's Services.

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Sector	Document
Children's Services (cont'd.)	Alberta Children's Services. (2000). *Start young start now! Report of the Task Force on Children at Risk*. Edmonton: Author.
	Alberta Ministry of Children's Services. (1999-2002). *Ministry of Children's Services business plan.* Edmonton: Author.
Justice	Alberta Justice. (2000). *Ministry of Justice business plan 2000-02.* Edmonton: Author.
Inter-sectoral	Alberta Children's Initiative. (1999). *Report for children's mental health initiative.* Submitted to the Minister of Health by the Children's Mental Health Design Committee. Edmonton: Alberta Children's Services.
	Alberta Children's Initiative. (2000/2001). *Student Health Initiative planning guide.* Edmonton: Alberta Children's Services.
Provincial associations	Alberta Teachers Association. (1996). *Partners in learning manual*. Edmonton: Author.

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Sector	Document
Provincial stakeholder symposiums	Alberta Initiative for School Improvement. (2000, May 24). *Opportunities and challenges.* Paper presented at the symposium at the annual meeting of the Canadian Society for the Study of Education, Learning Resources Distributing Centre, Barrhead, AB.
Regional Authorities, boards and programs, councils, institutions	
Learning	Edmonton Public Schools. (2000). *An investment in our future: 1999-2002 plans and 2000-2001 approved budget.* Edmonton: Author.
	Edmonton Public Schools. (2000). *Edmonton Public Schools board policies and regulations* [Online]. Available from *www.epsb.edmonton.ab.ca/resources/policy*
	M's School. (2000-2003). *Three-year education plan.* Edmonton: Author.
Health	Capital Health Authority. (2000-2003). *Capital Health Region business plan.* Edmonton: Author.
	Capital Health. (2000). *Guidelines for the role and organization of Community Health Councils.* Edmonton: Author.

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Sector	Document
Health (cont'd.)	Millwoods Community Health Council. (2000). *The Millwoods community consultation: Caring for our children and youth.* Edmonton: Author.
	Stollery Children's Health Centre. (2000). *University of Alberta Hospital policy and procedure manual.* Edmonton: Author.
	Westview Regional Health Authority. (2000). *Final report of the Westview healthy families program: A primary health care project.* Spruce Grove, AB: Author.
	Capital Health Region Child Health Program. (2001). *Child health program pediatric ambulatory clinics functional program.* Edmonton: Capital Health Region
Children's services	Ma'Mowe Capital Region. (1992). *Interprovincial/territorial protocol on children moving between provinces/territories.* Edmonton: Government of Alberta.
	Ma'Mowe Capital Region Child and Family Services Authority. (2000). *Proposed service delivery framework consultation draft*. Edmonton: Government of Alberta.
	Ma'Mowe Capital Region Child and Family Services Authority. (2000). *Ma'Mowe Capital Region Child and Family Services Authority business plan 2000/2003*. Edmonton: Government of Alberta.

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Sector	Document
Inter-sectoral	Capital Health Region. (2000). *Healthy Families Program.* Edmonton: Author.
	MacDonald, C.A., & Associates. (2000). *Evaluation of the Healthy Families Program.* Edmonton, AB: Region 10 .
	Edmonton Student Health Initiative Partnership. (2000). *Edmonton Student Health Initiative Partnership resource guide for ESHIP.* Edmonton: Alberta Learning, Health and Wellness, Children's Services, and the Alberta Mental Health Board.
	Edmonton Student Health Initiative. (2000*). Edmonton Student Health Initiative service plan.* Edmonton: Alberta Learning, Health and Wellness, Children's Services, and the Alberta Mental Health Board.
Other exo- and macro-system level Federal Provincial and community documents	Phipps, S. (1999). *An international comparison of policies and outcomes for young children.* CPRN Study No. F/05. Ottawa: Canadian Policy Research Network.
	Federal/Provincial/Territorial Advisory Committee of the Federal/Provincial/Territorial Ministers of Health. (1999). *Investing in early child development: The health sector contribution.* Ottawa: Author.

(table continues)

Sector	Document
Other exo- and macro-system level Federal Provincial and community documents (cont'd.)	Ontario Children's Secretariat. (April, 1999). *Early years study.* Toronto: Author. Canadian Intergovernmental Conference Secretariat. (2000). *First ministers meeting: Communiqué on early child development.* Ottawa: Author. Health Canada. (2000). *Alberta Primary Health Care Project from Health Transition Fund: Advancing primary health care in Alberta.* Ottawa: Author. Community-University Partnership for the Study of Children, Youth, and Families. (2000). *Community-University partnership for the study of children, youth, and families: Draft strategic plan 1.0.* Edmonton: Author.

Document Template

Document

Name:
Date:
Source:

Ecological System Level: micro, meso, exo, macro

1. Linkage Goals: (strategies) (include role)

Structure:

Process:

Outcomes: a) that have occurred
b) proposed outcomes for the child, family, professional, institution, inter-sectoral initiative, parent/public, community

2. Facilitators and Barriers: structural, attitudinal, process

Facilitators: where, why and how

Barriers: where, why and how

3. Indicators of successful linkages: in the outcome areas and at which system level

4. Healthy abilities promoted at the micro-, meso-, exo-, macro-levels: sustain health and wellness, withstand stress, promote greatest possible development, develop resilience

MEMO

Consider the scope of the linking (depth and breadth):

Are the linkages intra-sectoral? cross-sectoral? institutional? disciplinary? for child and family? for this particular child ? for all children at community level?

Note similarities and differences in any of the above areas (e.g., perspectives, processes).

Guiding Interview Questions for Parent, Professionals, Community Member

Perspectives to be considered by the interviewer:

a) the multiple points of view of child, family, the disciplines, organizations or institution, the policy sectors, larger community.
b) the structures and processes in the areas of the study subunits, for each question.
c) the abilities to sustain health and wellness, to withstand stress, to promote the greatest possible ongoing development (bio-diversity), and to develop resilience.

LINKAGES

For this study, a linkage refers to any human or non-human resource that serves to tie or link.

ROLE

1. With respect to facilitating health and well-being, what is your role for [the child]?
   What makes it easier? What makes it more difficult?
   How and why do you need support from other areas?

EXPLORE LINKAGES IN THE RESPONSE

2. You mentioned that you would [put a linkage example here]. It seems we all need to link to others. Could you tell me about the goal of that linkage? Was it successful?
   What aspects of (child) 's well being were influenced?
   What would make that type of linkage easier?
3. You mentioned (put a linkage example here). What was the goal of that contact? How was it achieved?
   What was the outcome for (child)? for you? If not achieved what could have facilitated it?

THE ROLE OF OTHERS

4. The school community: If possible, consider this question from the perspectives of this particular child and for all children.
   What is the role of the school including the principal?
   What support is needed at the classroom level for (the child)? for other children?

What kind of involvement and strategies are needed from other professionals to create integrated support in the school environment and also between institutions? What kind of facilitation is needed for public participation in the school?

Are there institutional characteristics that affect the necessary linking processes?

5. What are the roles and linkage goals of others in the following areas for [the child]?
    a) your child's health care institution?
    b) the family?
    c) government sectors including policy?
    d) the broader community?
    e) For the early childhood years, what supports were needed for (child)? How could these have been strengthened? What supports are needed for all children?
    f) When considering these areas for other children, is there anything else you would add?
6. With regard to implementing support for (child), what areas have been successful and how is that success shown?

    What areas have been unsuccessful? What were the results? How could these be improved?

    Are there structures or processes that help bring support together for (child)?

    What are the barriers to linking support that you have encountered?

OUTCOMES

FOR THIS CHILD

7. What have been the outcomes for [the child] so far with regard to his/her healthy development?

    What abilities have been encouraged or discouraged? Are there visible realities that show this?

    What factors have made these outcomes successful or unsuccessful?

    What kinds of linkages have helped achieve the outcomes? What barriers have hindered them?

    (Consider the early childhood years also)

What other outcomes would you like to see happen for [the child]? How could they be achieved?

8. In [the child's] case what outcomes does working together bring for the following areas, and are there visible realities in each of these areas that show these outcomes? It may be helpful to consider what kinds of abilities have been encouraged or discouraged in each of the following areas:
    a) For the family?
    b) For the professionals?
    c) For the organizations or institutions like the school community?
    d) For the policy sectors?
    e) For the larger community?
9. What are the outcomes of unsuccessful linking of effort and are there visible realities (e.g., bending rules, policy not followed) that show these for the following areas:
    a) For the (child)?
    b) For the family?
    c) For the professionals?
    d) For the organizations or institutions like the school community?
    e) For the policy sectors?
    f) For the larger community?

FOR ALL CHILDREN

10. Consider the previous questions from the perspective of all children. Is there anything else you would add?

IF YOU COULD DESIGN

11. You have described the outcomes that have occurred and that you feel are generally important. If you could design a system for (child) what would you put into place to facilitate these goals? It might be helpful to consider the following:
    What would be your goals for the child, the family, the school, other organizations involved, government sectors and policy makers, and the community?
    Why are these goals needed?
    Who should be involved to work toward them?
    When do we need to work together to provide the support?

Where do we need them to develop linked support?

How are these goals attained, using what kinds of structures and processes?

What characteristics indicate that successful linkage is occurring?

To design a system for all children is there anything else you would add?

Guiding Interview Questions for the Child:

1. Can you describe what it feels like when you are really well and strong?
2. Can you describe what helps to make you feel that way?
3. How do you feel when you are not well ?
4. How do you feel when you aren't getting the support you need at home, at school or in your community?
5. When does this seem to happen?
6. What kind of support helps you feel stronger?
7. What is helpful for your school to know about you? What kind of support helps you in your classroom? In other parts of school life? Do you need from your principal?
8. Usually we need help from many areas to make us feel strong and healthy. What kind of support is helpful from others such as: your family, your doctor, other services you might need, your friends, your community?
9. When you need support, what makes it easier to get that help? Do you have an example?
10. What makes it hard to get the help you might need? How does that affect you? Affect others? Do you have an example?
11. Who do you feel needs to work together to help keep you strong? When do you need that support?
12. How do you feel at the present time, with the support you have?
13. What other support would be helpful to you now so that you can feel very healthy? How should it be provided?
14. When you were small before you went to school do you remember what kind of support from others helped you feel strong and healthy?
15. When people are working together to help you, what benefits does it give them?
16. If you could advise us on how to work together to keep you and other children healthy, active and learning, what would you say?

Information Letters

I. Information letter for Interviewees:

Dear

I am a master's student at the University of Alberta Faculty of Nursing. My area is child health. I am learning about how communities can work together to promote children's healthy development. Many others are also interested in this. The study will include interviews with a child, their parent, their teacher, principal, their health professional and a community member. Policy and organizational documents will be studied.

I would appreciate time to speak with you about this topic. We would talk at a time you select. You may stop your participation at any time. Your information may be withdrawn from the study. Your contribution to the study will be anonymous and confidential. All information will be confidential except when professional codes of ethics and/or legislation requires reporting. All information will be kept locked at the University of Alberta and destroyed after seven years.

Permission for the study to proceed has been granted by the Health Ethics Review Board. If you have any concerns you may contact the Patient Concerns Office of the Capital Health Authority at 492-9790. The people at that office are not connected to the study investigation.

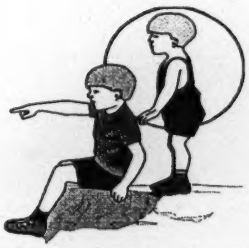
I would like to work with you to further knowledge for children in this important area. If you have questions or concerns, please contact me at 452-0277. Thank you for your time and consideration.

Sincerely,

For the letter to the parent of the child the following paragraph will be added:

With your permission, your child will be asked to assent to participation in the study. If he/she agrees, you may be present during your child's conversation with me. Your child may withdraw from the interview at any time and his/her information may be withdrawn at your request.

II. Information Letter for Child and Assent from the Child



Dear

I am a nurse who is learning about children. Now that you are getting a little older, I would like to hear about what you need to feel healthy at home, in school and in your community. If it is OK with you, I would like to spend a little time talking with you, as part of my project. I would also talk to others who care for you like mom or dad, your doctor, your teacher and your principal to hear what they think about keeping children like you healthy, happy and learning well. This may help us all learn more about what is important for our children.

If you have any questions you can ask me at anytime. If you want to stop talking or change your mind and do not want to do this anymore, that's OK. You could tell mom or dad or me that you want to stop. We will just be talking and will not be using your name.

If you write you name on the line, it means that you have read this letter or that someone read it to you. Signing your name means you would be willing to talk with me.

Thank you very much.

Sincerely

_____ _____

Signature of Child Date

_____ _____

Signature of Investigator Date

III. Follow-up Letter to Child

Dear:

A while ago for our research project, you and I spent some time talking. You had many good ideas. It is helping us learn more about what is important to children so they feel healthy and learn well in school. I appreciated it very much. Did you find the stickers inside? They are for you. Thank you for your help. I hope this is a successful and healthy year for you.

Sincerely yours,

APPENDIX B

EXAMPLE OF A CHART SUMMARY; EXAMPLE OF A DOCUMENT ANALYSIS BY TEMPLATE; PILOTING OF INTERVIEW FORMATS

Meso-System: Linkage Goals for Structure

Child	Her mother, father, brother, friends, teachers, nurses, secretaries, principal, doctors were structures that needed to work together for her
Parent For M	A school nurse available in M's school and all schools; there had been no early source of information on extra funding sources for M as should be available for all children with health challenges; preserving a positive, caring bond between M and her brother; preserving a positive relationship between M's brother and the school community that recognized the impact of M's illness on him; a classroom aide was needed for M; preserving the dayhome she had put together in their home as a somewhat controlled environment of social support to M and the family; as a parent she was unsure of the mandate of the school council and thought it difficult to advocate for a single child through this vehicle though a council could advocate for a school nurse or other needed positions, for example.
For All	Allocation in the school budget to enable support for other disciplines to access the students at school in a sustainable manner; more structure in the Child Health Program including human resources; increased linkage in the ambulatory care area including to public health units; an immunology clinic is needed; information on a child should be consolidated in one easily accessed area by all disciplines and family
Principal For M	A stronger, more up to date medical perspective from an ongoing relationship between the school and pediatric care; at present M did not qualify for funding according to the current "special needs" criteria in educational funding; the school's special needs coordinator was available to help with students that were funded; M's teachers had to work with any home-bound teachers that may in future be put in place for M to support learning at home
For All	Closer linkage with physicians and neurodevelopmental clinics; increased budget and access to other professionals to carry out a depth of support beyond assessment; ongoing support for parent volunteers and the school council; an increase in productive relationships with the greater community beyond the parent body such as with senior citizens and the business community; a stronger role from the district in building partnerships that benefit schools; ESHIP and community nursing were currently developing important partnerships; more effective communication structures; a doctor's office in most schools; children's services in some schools; team support for health, social and educational practice; support to children and parents in the early childhood years available to all; more coordinating bodies; a coordinating body at every school that is similar to a school council; more funding dollars for programs and human resources was a critical need
Teacher A For M	A positive relationship with M's mother who contributed a great deal to classroom relationships and to the facilitation of M's learning; a cognitive learning specialist would help support M's learning; home schooling may be a future structural need; an ongoing structural link from her physician was needed for M and for relationships involving the teacher, parent and other students and parents; a classroom aide for her class would increase abilities and help with large class size and 5 or 6 needy children; M needed a coordinating position to facilitate linkage; both educational and health institutions share responsibility to support and inform M's family; funding was needed to permit proactivity in meeting needs; previous relationships with M's brother and parents were enduring linkage structures.

For All	Strong school-community relationships with parent volunteers and skilled community volunteers; promotion of school councils as supportive structures for school communities; much greater linkage structure with health areas and other supportive professions; more coordinating positions and teams in the community infrastructure
Teacher B For M	Relationships within the school with children like M were sources of enrichment and learning to all students and teachers
For All	When parenting skills seem lacking there is a responsibility in the school community to have structure that enables access to other support areas from the school environment; principals, counsellors and other disciplines are needed at the school to facilitate access to other supports for students and families; the school was " somewhat" a social institution; it should be " people friendly…known as a good place for their children"; in general a "remote connection" was needed between Children's Health Centre and the school; the parent not the health area should relay information to the schools unless parent unable to do so
Physician A For M	Physician A's linkage goals had structure that helped meet M's needs in the physician's specific area of expertise; the goal was to help M's parents look after M in that area and to alert the primary physician about other areas of needed care; a team approach was needed; the parents and primary care physician had responsibility to put a team together and to look out for the "global view of the child"
For All	The structure of the school community was the " child's workplace away from home" and crucial to their functioning; policy needed to accommodate as many student needs as possible; communication structures between teachers and physicians were needed; other kinds of school environments such as the classroom in the Stollery were needed to accommodate many kinds of transition support to regular classroom environment; linkage with both parents must be a goal especially with separated parents; communication with other potential caregivers with parent's consent; physicians and nurses were needed to share information where appropriate; service teams contributed to transition of higher needs children to the community; coordinating positions were needed; initial support comes from the family structure, then extended family and then extends to community around the child and family "slightly larger and larger circles that support that child"; access to a continuum of knowledge sources was needed for an efficient use of expertise; caregivers close to the child should be able to carry out their services in another institutional environment; e.g., Hospital when needed; stability of relationship was a critical factor; respite daycare environments for families of children with heavy medical needs were needed; Physician A unsure if there were enough knowledge sources in the community about children but they were necessary
Physician B For M and All	M has a team of 4 physicians and other hospital staff; she has recently become home schooled due to fragile immune system; was very important that others protected M and guarded her environment; Physician B was aware that Edmonton Student Health Initiative Partnership was beginning but not aware it could benefit M; thought it was mainly for neurodevelopmental problems; a public health nurse would be helpful to the family; the Stollery Children's Centre brought people including specialists, together to work, research and teach; Home care and public health nurses were sources of more in-depth support to families; linkages that relate people and organizations were seen as critical elements to share experiences and knowledge

Child Advocate For All	Role of the Child Advocate is defined in the Child Welfare Act; the advocate is to represent " tights, interests and viewpoints of those children receiving services under the Child Welfare Act"; legally it includes Handicapped Children's Services but this area has not been part of the program as many of these children have "natural advocates"; when a child is separated from its natural family the state becomes the guardian and " the child becomes connected to a large bureaucratic organization who's form may vary from time to time"; the advocate may become a supportive structure to speak for or with a child; an Administrative Review was available to question decisions; the Child Welfare Appeal Panel could give final binding decisions to an appeal process; largest group served were adolescents; budgeted resources were usually the root of how well linkage networks succeeded; caseloads impacted outcomes; alternative programs were needed for many young people who couldn't handle regular classroom environments; currently there was little interdisciplinary structure; school was seen as an ideal structure to connect families to community services; linkage structure around a school should include principal, school staff, parents, service agencies, community contacts, students; in future the Office of the Children's Advocate may provide a resource to support community groups of Children's Services Authorities interested in their own advocacy programs; parental organizations and school councils have an important role in increasing community capacity to advocate for children, youth and families; Alberta has now formally signed the UN Convention on the Rights of the Child which describes the balancing of the rights of the child, parents and the state; foundations were becoming structures with an increasing advocacy role; linkage structures with aboriginal communities were vital; schools, other institutions and sectors would benefit from " seeing themselves as one service system as opposed to separate service systems, a service system for children"; universities and other learning institutions were greatly needed to contribute to support to children, families and communities; future priority areas for the Office of the Advocate were young people in the Young Offender system and those with Protection of Children Involved in Prostitution legislation; more coordinating structures were needed due somewhat to "bureaucratic principal of designing structures separately with separate purposes"; a web-based resource area showing service access was a major need
Gov. Rep	Teams of service providers who work and meet; structural goals that promote "mixed teams, collocation of services, cross fertilization " and clear "hand-offs" among institutions and sectors

Document

Name: Capital Health Region Business Plan
Date: 2000-2003
Source: Capital Health, Region 10, Alberta

Ecological System Level: exo-system

1. Linkage Goals: (strategies)

Structure:

- Canada's largest integrated academic health region. It has university connections and partnerships with other post secondary institutions.
- 7 community health councils
- Partnership are encouraged with governments, business, industry, community agencies, school boards, foundations and other organizations.
- Comprehensive communication plan
- Participation in the Provincial School Health Initiative.
- Partnership expansion is to include Regional children's services sector (Ma'Mowe) and Provincial Mental Health
- Development of a regional framework for integrated planning, decision-making and evaluation of ambulatory services in acute settings.
- Academic, clinical and research infrastructure;
- Developing a framework for community consultation is cited as a linkage goal.

Process:

- Key areas of process are: providing health information, promoting health, treating illness and injury, providing supportive care, advancing education and research.
- Advocacy for supportive legislation and policy.
- Development of a 24 hour integrated telephone and web based service with advice and information on Capital health services
- Develop a communication plan for convenient access to service and information.
- Proposal process request has been submitted to expand regional continuing care system with voluntary and private sector partners.

- Linkages are needed to achieve 2001 accreditation by Canadian Council of Health Services Accreditation.
- Core business framework had consultation and advice from community members, staff and physicians.
- Coordination of " regional service, human resource, equipment and capital project plans" (p. 24)
- Collaboration with Children's Services Authorities, School Boards, and other stakeholders in planning and delivery of services for children. Collaborate with Children's Mental Health Initiative.

- Increased involvement of regional physicians in resource allocation decisions.
- Work with University of Alberta and other post secondary institutions to increase leadership role as an academic health sciences region.
- Improve morale of workforce through staff development, recognition of service excellence.
- Benchmark key services with partner organizations across Canada and North America.
- Develop and strengthen partnerships
- Co-locate partners
- Develop primary care centres in growing communities
- Simplify ways for public to receive health information
- Aboriginal Health Services guide has recently been published. There is now an Aboriginal Wisdom Committee.
- encourage innovative partnership arrangements or infrastructure needs.
- Use of cross-site benchmarking
- Ambulatory Care Review is underway

Outcomes:

- Vision: "Healthier people in healthier communities"
- Excellence of practice
- integrated, accessible, affordable health system, sustainable system and workforce improved quality of work life within the system
- prevent and reduce accidents and injuries, prevent and manage communicable disease, influence community leaders to make health sustaining policies; reduce number of low birth weight babies

2. Facilitators and Barriers:

Facilitators:

- planning frameworks as detailed above
- development of coordinated intake, improved crisis services, more day programs and service expansion for Children Mental Health Services.
- Co-location with partnering agencies such as schools, mental health, children's services, AADAC.
- Development of multi site info systems is beginning
- Care Maps are proposed

Barriers:

- There is no specific mention of how children, youth, families, early childhood areas and schools in Region 10 were consulted about the strategic goals of the business plan though it is indicated that Community Health Councils provide input on youth and child health issues.

• Participation in joint sector initiatives for children such as ESHIP will require development of performance measurement and outcomes reporting systems that reflect involvement of each system and integrated practice.
• Focus on planning or measuring a continuum of community care for children and youth is not evident.
• Measurements described are very narrow in scope for children: immunization rates, communicable diseases and low birth wt. They are not sufficient to promote proactivity of support for childhood.

4. Indicators of successful linkage:

continued performance monitoring
ongoing feedback from public and community health councils
current health status report
sustainability
public confidence in the system
decreased rate of communicable diseases, increased immunization rates, reduction of low birth wt babies.
Increasing rate of public self rated knowledge of the system.
number of partnership agreements in place
evidence of advocacy efforts
increase in centres seeking accreditation

5. The healthy abilities enabled: sustain health and wellness, withstand stress, promote greatest possible development, develop resilience

As an integrated and academic healthy care region is a primary system goal, the healthy abilities of the meso-level are being encouraged. Tertiary care appears the primary focus at present. Participation in cross-sectoral secondary and primary community care planning is beginning. Some of these efforts in the childhood area are dependent on provincial funding (ESHIP). Resource support is of primary concern at present. Until that is resolved, a comprehensive community care plan in the region for children will not be in place.

MEMO: Scope of the linking (length and breadth), Intra-sectoral? Cross-sectoral? Institutional? Disciplinary? child and family? for this particular child? for all children at community level? Noted similarities and differences in any of the above areas

Development of a framework for community consultation has been recognized as an important goal.

Consultations for business plans are including community council input but only from councils in their particular sector. However school council parents may never access the health council to be able to bring to Capital Health the perspective from the school, unless this practice is built into a framework of consultation or becomes a used process link.. Without this link, the voice of children, youth and school communities may be quite

weak. For Health councils, it may also become a way of accessing the voice of children and youth who may not normally be a part of consultation processes in Capital Health. Inconsistent consultation may occur in regional authorities if process such as this, using these linkages is not an expected part of consultation.

As indicated in the plan, integration and coordination must occur on a number of fronts: service, human resources, equipment and project planning.

Children's health issues are listed under priority health issues.
If they are a priority for service and health promoting effort, the role of health in schools, early childhood areas, should be more visible so this area can contribute to sharing responsibility for comprehensive building of healthy school communities.

Increased involvement of regional physicians in resource allocation decisions, as a goal, hopefully will increase accountability for service quality that includes participation in cross-sectoral community care planning for children, and advocating for integrated and interdisciplinary practice. Increased participation and linkage increases responsibility for careful planning of resources.

There is development of a regional framework for integrated planning, decision making and evaluation of ambulatory services in acute settings.

Increasing rate of public self rated knowledge of the system. is a goal for the system. M's mother's comments indicate this is a real gap that needs system attention.

Participation in joint initiatives for children such as ESHIP will require development of performance measurement and outcomes reporting systems that reflect involvement of each system

Performance measures are very disease or accident oriented. Other areas of child, youth and family healthy development or conditions such as those with environmental components e.g. childhood asthma, are not focal points of measurement in this plan. There appears little resource allocation to proactivity for child/youth health.

The required provincial Public Health Targets for health authorities, do not show a target for childhood healthy development other than low birthweight, infant mortality and at least 75% or population age 12 and over do not smoke. This indicates a significant gap in measurement and in system priority for childhood in the region.

Assessing continuums of care for children in the community is not mentioned in the plan

There appears some planning underway for community implementation of a continuum of care, such as seen in primary care development and the Ambulatory Care Review.

Capital Health is beginning to convert to multi site information systems.

Piloting of Interview Formats

Two pilot interviews were carried out. One was conducted with a parent of a child 11 years of age with allergies, including a severe allergy to peanuts. The interview was conducted in her home. This mother used the questions as a guide while expressing her thoughts about the linking of many kinds that she felt was needed to keep her son safe, healthy, and happy. Her ideas were very detailed, and she felt that the questions were useful in covering the broad territory of the multiple perspectives and the research questions. She felt that it was useful to use semistructured questions and recommended some guidance from the interviewer to assist her in making distinctions between her thoughts about her son and those she wished to add concerning all children. She felt that considering the perspectives of others was a challenging exercise, but worthwhile. Her interview was one hour and 30 minutes long. She stated that she felt comfortable with this length of time and could have extended it.

The second pilot interview was conducted with a school principal of an elementary-junior high school that has a program for children with complex needs, including learning disorders. She stated that the conversation was very relevant to her daily work and timely because the Edmonton School Health Initiative Partnership was currently a focus in her work. It was important to her to talk about her experience from years of work in the system and about her views on the perspectives of others with whom she worked closely, including parents and the students themselves. She based her conversation on her views of the situations for many children rather than for one particular child. The interview was one hour and 20 minutes in length. There were no other suggestions made for changes or added questions. The questions appeared useful in stimulating wide-ranging ideas and in encouraging multifaceted views. Because the conversation could easily lengthen with the range of questions, inquiry about the desired length of time to be devoted to the interview before the interview started and halfway through the interview was carried out to accommodate the time desired for the expression of ideas.

APPENDIX C

LINKING OF SYSTEM DESCRIPTIONS: ECO-SUBSYSTEM ANALYSIS

Linking of System Descriptions: Eco-Subsystem Analysis

The system of data analysis is summarized in Table 2. In this part of the AMESH analysis, each level of the ecosystem is described by the study participants. The descriptions centre on the functioning of each ecosystem level for M, the child selected for the case study, and then for all children as determined from participant conversation as well as through the many documents reviewed that were directed to the context of children in general. In addition, the state of linkages in institutional, regional, provincial, and national level documents is detailed and linked. The Health, Learning, and Children's Services sectors, inter-sectoral initiatives, and public participation are described.

The following research questions are addressed:

1. What are the linkage goals according to each perspective and ecosystem level for linkage structures, processes, and outcomes?
2. What are the outcomes of successful and unsuccessful linkage for children, families, and communities?
3. What are the barriers and facilitators to linkages?

Bronfenbrenner (1979)) gave the following definitions of the ecosystem levels: The **micro-system** is "a pattern of activities, roles, and interpersonal relations experienced in a given setting with particular physical and material characteristics" (p. 22). The **meso-system** is "interrelations among two or more settings where the child actively participates" (p. 25). The **exo-system** is "one or more settings that do not involve the developing person as an active participant but in which events occur that affect or are affected by what happens in the setting containing the developing person" (p. 25) The **macro-system** is "consistencies in the form and content of lower order systems that can exist at any level of the culture as a whole" (p. 26).

Eco-Subsystem-Level Analysis of Participant Conversations

The analysis of conversations of participants within each eco-subsystem level is described below for M and for all children, by their linkage roles, structures, processes, outcomes, barriers, and facilitators.

Ecosystem Linkage Roles

This section describes how roles of self and others were perceived with regard to linkage. These perceptions have implications for linkage structures, processes and outcomes.

Micro-System Roles

M was keenly aware of what makes her feel better, as well as the care, support, and trust she needs from those caring for her. She sensed her own role in sustaining the constant adapting and courage so vital to pursue a healthy state.

All participants saw their roles as supporting the child and family at the micro-level, validating needs and advocating for them.

Meso-System Roles

M knew who had to contribute support to help her quality of life. She knew that she did not understand the extent to which they need to be involved but sensed with whom she needs to have a positive relationship. M's mother stated that she is overburdened because she has to keep track and relay information for M, the family, M's physicians, friends, and the school. The parent was seen by all as the primary facilitator of information sharing if he/she was assessed as able to carry out this role. However, there was agreement that the systems have a role and responsibility in helping parents do this.

All participants saw the school as both an educational and a social institution. All identified a critical role for parents and community groups to coordinate efforts through the schools and help with children's needs in the community. The sharing and coordination of knowledge to identify and meet needs proactively was stressed. The school community and major child health areas were seen by all as potential significant facilitators of linkages for students and families. All participants emphasized the importance of the advocacy role within all ecosystem levels. The child advocate stated that all physicians, including specialists, should exercise their advocacy for children, families, and communities, particularly because they are in positions to see needs within the systems.

Exo-System Roles

M's mother, despite having been in the systems for 10 years, stated that she still did not have knowledge of what the regional, institutional, provincial, or federal systems could do for children with more complex needs like M's. There was agreement among participants on the roles at the exo-level. The need to collectively develop the abilities to meet needs at the individual level, protect children and families, and develop their abilities to prevent underestimation of the child was seen as very important. The exo-level linkage was seen as having a large educative, knowledge-sharing role, a linkage role that brings a preventive, capacity-building, and resilience focus to systems and institutions; that encourages parental and community advocacy to bring needs to a collective table to help with prioritizing needs and allocation decisions; that describes collective needs and strategies, develops process for tapping community resources, promotes interdisciplinary knowledge, provides positions that bridge areas and solve linkage problems; and that provides ongoing learning about how to work together as communities to strengthen public systems and the valuing of children and families.

Macro-System Roles

For M and for all children it was felt that parents, institutions, and communities have critical roles in supporting children and providing the integration and coordination to do this well. They themselves also need to be linked to each other to do this job well. All participants agreed with physician B that some cross-linking is evident at higher institutional levels, but it often is not carried out at a level where it is "practical enough" for families. Its benefits often do not reach the environments in which the child actually lives. Knowledge about childhood is not shared broadly enough in communities. All described a major role of each system level to address vulnerability and help children feel confident in developing their potential. All participants felt that policy and government sectors have a critical role in helping communities function well together All participants agreed that communities and professionals have a responsibility to help children to help themselves and each other. Strong linkage of children and youth to other community areas helps to facilitate their learning about the "importance of community and how it has helped them" (parent).

Ecosystem Linkage Structures

Linkage structures in the case study were those structures that were formed from the act of linkage.

Micro-System Structure

M recognized that she has a supportive structure in her home, classroom, and limited community environments. All participants described the importance of team structures, easy access to knowledge and supports, promotion of abilities, early identification of needs, flexibility to implement small groupings, support during transition phases, preservation of a healthy nuclear family, constancy of relationships, advocacy structures for children's best interests, and budgeted resources to provide these in both early childhood and school years.

Meso-System Structure

All participants outlined the importance of a team approach for M. M's school was a pilot school for the provincial Safe and Caring Schools initiative. Edmonton Student Health Initiative Partnership (ESHIP) had just initiated service teams in schools with services in the areas of speech and language, occupational therapy, nursing, and emotional and behavioural services. M had not yet been referred to ESHIP; her primary physician (physician B) was not yet aware that ESHIP services could be used for M. Neither physician had been made aware of the extent of development of ESHIP services. Most participants agreed that more involvement and communication from the health disciplines are needed for M and her family. M had not qualified for funding under the current learning sector's special needs criteria because her needs were considered more medical. There are no funds to put classroom support in place for her, and her class size is quite large.

For all children, the principal described the possibility of developing a linkage structure, including a representative from this service team, which was more inclusive than a school council, at each school as an ongoing linkage structure for a healthy school environment. Physician B stated that more resources to help provide closer community connections from the child health areas were not in place. More involvement of school nurses was seen as needed. All saw the school as needing to become a well-linked

structure to major areas of community support for children and youth. Public boards, school councils, and parental organizations were considered important structures for advocacy. It was agreed that more resources are needed to put effective linkage structures in place to meet the needs of all children. More transitional and alternative structures need to be developed. All agreed that early childhood structures for all children are just as vital as school-age structures. All described the necessity for more integrated, coordinated linkage structures and processes for early childhood as well as for school-age children.

Exo-System Structure

The desired linkage goals described by all were often partnered structures that could interrelate and coordinate for planning, shared accountability and bringing together areas of expertise for a shared workload. It was recommended that they have joint sector, flexible budgets, and communications structures to provide cross-sectoral and community support. Most considered the availability of teams and problem solvers to bring closer "ground-level" structuring around the child, family, institutions, and community to be a great need. Structures for advocacy and due process as a constant presence around child, school, and community areas were also considered essential parts of the structuring of systems and community. Cohesive structures, including integrated, easily accessible knowledge areas, were seen as vital for childhood.

Due to the speed of societal changes, increased incidence of site-based funding and governance structures in schools and regional authorities, the ability to link beyond single site or region to multi-site, and rural-urban and provincial linkage were considered of critical importance by all. It was felt that there are many more inter-ministry connections needed for children. The government representative indicated that these are continuing to be developed. Many children in child welfare and many Aboriginal children currently do not have enough protective structures around them, according to the child advocate.

Macro-System Structure

There was agreement among participants that more coordinating structures are currently needed in communities to effectively share knowledge and meet needs on many levels through more horizontal rather than hierarchical structuring to ultimately reach the

child. Many community areas were seen as untapped resources to support childhood, and structure is needed to clearly take the initiative and develop its potential. Potential for greater internet access was seen as an important structure for linkage to share knowledge. All stressed the essential ingredient of collaborative, stable, sustainable structures and relationships throughout the ecosystem levels. Each participant's descriptions indicated a significant lack of linkage structure around community institutions. The government representative described the state of the population in Alberta as a significant structural element for linkage. There had been "perhaps too much of an emphasis in Alberta on the economic role and less on our roles in families; . . . rebalancing is coming. . . . The largest generation of people is moving into their fifties when broader, kinder, gentler, more family-oriented perspectives" would, it was hoped, prevail.

Ecosystem Linkage Processes

Linkage processes constituted the processes engaged in by structures involved in the linkages.

Micro-System Process

M felt that she needs physical contact; play; freedom from stress and the ability to cope with it; healthy relationships with family, peers, and others; normalcy; strong communication; successful treatment from physicians; and help with her weaker school subjects. The principal and teacher A did not feel that the school is able to provide enough help and learning support in the classroom to M and her family.

All participants described the importance of linkage process for ongoing assessment of children and provision of protected micro environments that promote strengths in the child and "healthy living" (physician A). The advocate stressed the importance of process that teaches children their rights and preserves the balance between rights of the child, family, and community.

Meso-System Process

M identified more help with her schoolwork and good communication process as necessary for her happiness. All recognized the importance of protecting M's environment. The principal was not sure what else could be done or whether anything was really necessary. M, her mother, and the school staff recognized that M requires

more learning support than is being provided. This was not identified as a process need by M's physicians. M's mother had to take a stronger role in gathering and sharing information about M because other caregivers were so busy and a team approach was minimal. She stated that a nurse to coordinate process and planning should have been in place for M as soon as she was diagnosed.

The child advocate, parent, and physician A stressed the importance of respecting, listening, and providing due process for parents and children. All identified the ability for flexibility of support to follow the child's environments and the importance of preserving the ability to meet the particular needs of each child as critical. There was agreement on the great need for positions of "problem solvers" for children and families, for proactivity within community systems, excellent communication, respect, and opportunities for interdisciplinary learning. The planning for care of the child at school was seen as just as important as planning for the child at home, but this transitional linkage process is often not carried out successfully. There were varying degrees of support for having the parent as the prime informant, but as the child advocate, parent, and others recognized, parents are not always able to carry out linking processes and are often further stressed by it. The child advocate, principal, teacher A, teacher B and the parent stated that linkage among professionals and families for synergistic rather than competitive process is frequently never undertaken.

The dynamic between information sharing and the confidentiality of information is a major influence and a frequent barrier to linkage. There was overall support for the advocacy role and for recognition of the importance of increasing advocacy skills, including the knowledge of child, family, and community rights, in the community. All recognized that stress affects communication patterns and brings out personality traits. Consideration of this is needed in developing relationships. Consideration of the child's context within their culture, such as the Aboriginal culture, was considered essential. The importance of standards and evaluation of linkage practice within this culture was essential and often not implemented (child advocate). All expressed the need for more coordinating processes throughout the systems and for more knowledge sharing at the community level.

Exo-System Process

All identified the need to closely link exo-level government initiatives for children, to use inclusive process in them, and to communicate extensively about them internally and to the broader community. Broadly defined health for childhood supported by the purposeful inclusion of health, learning, and children's services sectors was considered a critical focus. All reiterated the importance of more effective linking processes between continuums of care. Contribution to the inter-sectoral primary to tertiary continuum from within the health sector, including its linkage with schools, requires more development, according to the parent, principal, teachers, child advocate, and government representative. To do this, funding strategies that enable planning and process for the whole child across environments are needed. Developing early childhood areas that have access to linked support for children, families, and communities is currently an area of the process that has not been developed to support healthy early childhood community practice. Early childhood sites and schools require more coordinating, planning, resourcing, and practice to develop as healthy school and early childhood communities with health, social, and learning support to children, families, and communities. The promotion of community linkage, including business participation, to share resources and strengths was a goal for all. The child advocate stressed the critical need that was often not met, for ongoing linkage process that implements an appreciation of organizational learning and evaluation, using culturally sensitive approaches.

All of the participants advocated linkage to systematic, specific areas of knowledge to assist collaborative linkage infrastructure, so that a picture of resources and knowledge about childhood is available to the whole community. This implementation would enable the wide systems view of support described by physician A, which was a goal for all children, families, and communities.

Macro-System Process

Participants' descriptions of the macro-system process stressed cohesiveness across sectors and community areas, including with children themselves. All participants gave significant emphasis to process with parents, and several felt that this is where many processes should actually start. Creating the macro-scale flexibility for knowledge and support to follow the child and the parents was a process goal for all of the participants.

To do this well at the implementation stage, highly developed skills for communicating needs have to be present within open, receptive systems. Developing the institutional ability to link well with other sectors and community areas, was considered a vital linkage process by all. Societal discussions about the goals of a healthy childhood, to increase awareness about the rights of children, families, and communities, were considered a greatly needed process by the parent, child advocate, and physicians A and B. Alberta has made a deliberate choice to keep its taxes lower to help family budgets. The government representative stated, "The jury is still out whether you're better to leave the dollars in the family pocket . . . or run it through government systems and give it back in some sort of services." Processes that increase the valuing of childhood and parenthood in visible ways are an ongoing need, according to all of the participants.

Ecosystem Linkage Outcomes

Linkage outcomes were the results of the dynamic interactions of linkage structures and processes.

Micro-System Outcomes

M felt well supported in her micro-environments, with close family relationships and strong relationships with peers and teachers at school. Her mother's dayhome in their house provided other children to play with as a social network in a more controlled, safe environment for M. She has a great deal of difficulty in math and finds other schoolwork frustrating. She has frequent symptoms from her illness that cause significant stress, curtailing activity and requiring major coping skills. She sensed when there is increased stress in family members when linked support is not occurring. M knew that she needs the support of others to maintain a degree of wellness to cope in her micro environments. Significant effort was required by M's mother to maintain constant vigilance in M's micro environments and acquire enough information to do this well. The family has experienced stressful outcomes regularly, some due to insufficient linkage. M's mother described the family as in a state of "chronic stress" that has affected all of them. Family and school staff recognized the need for more help with learning for M at home and at school than was currently given. All recognized the importance of vigilance and protecting M's environment, but they were not sure how best to do this.

For all children, all participants described experience with the negative outcomes resulting from poor linkage that could exponentially exacerbate stress and increase negative outcomes for the child, adding to the original stressors. It was felt that the particularities of the child, family, and classroom are often not addressed and could increase negative outcomes for all concerned. Caregivers at the micro-level were seen as having a great deal of potential power to increase positive outcomes, but they are very dependent on the successful functioning and outcomes of the other levels in the ecosystem. All considered linked support for families as an essential area of linkage for the micro environment, in addition to specific linkage for the child.

Meso-System Outcomes

M is very close to her family, enjoys her peer group, and is content in school, though she wants more learning support. She is achieving her grade potential but not her age potential. She has many challenges on a day-to-day basis, but still has the family and community support and resolve to meet them. School staff, M's mother, and the physicians agreed that M has much to teach others and enrich the school community.

The principal expressed a lack of understanding of the full extent of M's medical condition and of her needs. He did not feel that he was fully informed, though M's mother had relayed information. He felt that more medical communication would have been most helpful to increase the level of trust in his relationship with M's mother. M's primary physician lacked a full awareness of the extent of the needs for M in the school environment. M's mother expressed concern about what the school might do with other information from the physicians, though she had given permission for the school administration to contact the physicians. She was worried that more information from the physician might result in being required by the school to home-school M, which would add to the family stress due to M's isolation. M's primary teacher felt that she could not fully support M in the classroom and use the peer relationships to their potential without more health knowledge about M. M's parent felt overburdened and alone with the job of constantly relaying information and trying to gain access to it.

Though the family relationships with all the professionals were positive, M's family needs help beyond what the systems have provided. Access to other supports has often been "by accident" (mother). She did not trust the systems to give her family full

support. She felt betrayed rather than protected when at times she had not been given full information about M or proactive access to resources, or when her knowledge of M had not been validated. She stated that she has had to be more assertive and aggressive because there is not a fully coordinated team approach for M.

All participants agreed that they did not have enough knowledge of resources for children in the community. Specialists stated that there is no time to coordinate support and no other positions in child health are currently in place. ESHIP services are just beginning at the school level. All felt that there are many untapped community resources and possibilities for advocacy. There are gaps in the areas of whose role it is, as well as the knowledge and time to carry them out. Regional and board initiatives to help with linkage are necessary, but actions usually become meaningful only if carried out at each school level, according to the school principal. All declared a lack of knowledge about services and supports and difficulties accessing resources for children and families. There are many unmet needs in M's school and all schools. Early identification of needs is often not possible in the present system, and lack of trust is a significant factor. All agreed that there must to be more emphasis on and resources for the early childhood areas.

There was consensus that "success breeds success" (physician B). The linkage goal of shared power, including with parents, was emphasized by M's mother and the child advocate, but supportive service structure for parents needs to be in place to accompany this essential element of linkage for maximum benefit to children, families, and professionals. All provided examples of how institutions "hunker down, pull in boundaries" (child advocate) when they are underresourced and/or their concerns are focused on their own areas only. There was agreement that currently many children's needs are not being met adding to suffering in children, youth and families.

School staff, parent, and child advocate stated that public participation to help meet children's needs is difficult to sustain without resources and effort. All agreed that the sectors still do not see themselves as "one service system" (child advocate) for children, youth, and families. The participants acknowledged significant effects on each other when poor linkage occurs, as well as the effects on school communities, other institutions, sectors, public participation, and policy formation. Reduced community knowledge about childhood is the result, as opposed to linkage that shares and increases

knowledge. Children without supportive linked structure were described as significantly at risk and directly affected at biophysiological levels. There was agreement that though the systems are improving, many children are still experiencing a lack of linked support across environments, affecting their access to opportunity and optimal development.

Exo-System Outcomes

Difficulty in determining what services and supports are available was a frequent outcome described by all participants. Access to knowledge or services is often even harder to achieve. The parent stated that linkage lacks organization and often occurs "by chance." All felt that major linkages across systems are not yet occurring at an optimum level, although the Alberta Children's Initiative had initiated some momentum in this area. All agreed that there are not enough resources and positions in the systems to give proactive, sustained, linked support to parents to keep the child and family well linked to community support. Gaps are wide, and negative outcomes are evident. Often parents have to take on the added responsibility of navigating systems themselves, in times of their own vulnerability. This results in the underestimation of needs by parents and professionals, as well as exhaustion and negative stressful outcomes in the child and family and community.

All participants described to varying degrees the lack of knowledge-sharing areas concerning childhood that are available to the community as a whole. All saw the potential for more linkage through professional and community practices, using government funding initiatives. However, except for the principal, the participants knew little about the Alberta Initiative for School Improvement (AISI) and SHIP. The parent had not heard of them. The government representative from Children's Services was not familiar with AISI, a major funding initiative planned by the learning sector with little cross-sectoral involvement. However, this representative was also new to the position. The child advocate had also not been informed about AISI.

All felt that schools do not have sufficient levels of community linkage, which sometimes has profound negative effects on the child, family, and community. The importance of linkage structure in the early childhood areas was considered just as important as school linkage. A review of the Child Advocate Program recommended the expansion of the role, but current resources do not meet the current demand from

Alberta's very vulnerable children. Participants stated that even with new government initiatives, the needs far exceed resources. The government representative stated that federal funding and processes are factors that affect provincial resources and governance structures. Each participant described significant areas in the linkage continuum within and across systems that were locked and compartmentalized. The child welfare system was described by the child advocate as in significant gridlock in such areas as foster placements for children, supportive facilities for young people, and care for children with mental-health needs. All agreed that some movement towards learning how to work together as communities was taking place. However, the ecosystem was not seen as nearly proactive enough on a macro scale.

All of the positive outcomes detailed describe the healthy abilities of ecological integrity in the child, family, and community. This includes the development of abilities in professionals, sectors, and communities. The government representative described Alberta as one of the provinces that is furthest ahead at developing initiatives that stress collaborative linkage. Negative outcomes were seen as reducing abilities in the same areas. Physician A suspected a direct correlation between supportive social structures for children and the biological severity of disease. The child advocate noted negative, unsafe outcomes for many children in government care, including Aboriginal children. There are major challenges of linkage due to some Aboriginal community structures and cultural values, that sometimes reduced the care and protection required by vulnerable children and families according to the Advocate. The participants indicated that exo-level planning could significantly influence micro outcomes.

Macro-System Outcomes

There was a keen awareness among all participants that all children are vulnerable and need broad-based, linked community support for healthy development. The effects of children with more complex levels of vulnerability on all the ecosystem levels were seen as significant. Present societal conditions and values cause stress, and this stress is amplified when linking structures and processes are not present to buffer that state and create efficiency and achievement of goals. In the current state of the ecosystem, all participants agreed, "much more could be done" (principal). Specific areas of linkage for which to aim were described, but front-line professionals, parent, advocate, and M herself

expressed a lack of knowledge as to how to implement successful linkage infrastructure that could cross ecosystem levels to develop a larger scale. The parent, advocate, and professionals described a significant underestimation of the importance of early childhood and of what children need to develop well. Lack of knowledge sharing is a major factor.

With the current implementation of regionalization, site-based management, and certain cultural hierarchies such as those found in some Aboriginal communities, some children in smaller communities are not faring as well because linkages to major areas with crucial knowledge do not have sufficient strength. An emphasis on work and economics, in the Province of Alberta, as described by the government representative, has significant negative effects on linkage abilities in the community. School staff and parent described decreased volunteering at schools and interest in school council participation. Mentoring programs for children and families need resources to succeed, according to the child advocate. Traumatic family changes and more temporary family arrangements are important current societal contexts that government and professionals and the parent recognized.

The desired outcomes of successful linkage, expressed from the perspectives of the participants, were in the areas of maintaining constancy of support, maximum effort for sustainability of linkage, and a preventive focus in linking strategies; recognition that the act of participating, broadly consulting, and contributing together make us healthier; the benefits of increasing access to government by citizens; provision of "maximized opportunities" (government representative) for all children, families, and communities; and development of more family-centred communities.

Alberta "hasn't done badly" to support its children, according to physician B. There have been many improvements, and the Alberta environment for children is better than many. There is more equity of opportunity than in the United States. However, it could still not compare to places where the situation is better, such as Scandinavia. The government representative stated "in many ways, Alberta is at the forefront." According to the National Longitudinal Study on Children and Youth, Alberta children, the government representative stated, are "doing better and our parents slightly better" than in most provinces, though causal reasons are difficult to pinpoint. All participants agreed

that there are many unmet needs for children and youth, with many tragic consequences. This outcome occurs in spite of large surpluses in the province, according to the child advocate. The government representative felt that Alberta is better linked than many provinces and is working toward ongoing improvement.

Ecosystem Linkage Barriers

Linkage barriers were conditions within the ecosystem that interfered with linkage processes and structure formation

Micro-System Barriers

Symptoms, treatments, and interference with normal energy patterns affect M's ability to link and seek support from others. All described the perusal of ability and overall health as desired outcomes for M and for all children. All saw stress and isolation as significant barriers. Currently, there is an inability to direct proper funding to M to meet her classroom needs. Teacher A felt that without more knowledge about M's condition and how to help her, greater peer support and understanding are difficult to develop in the classroom to sustain M. There has been significant difficulty in bringing coordinated linked support to the micro environments of M and her family and all children due to lack of resources, integration, communication, and knowledge.

Inclusive peer support in the micro environments was seen as often not provided for many children. Many children in the care of the government have been abandoned by their families and/or schools. Several participants noted that the public systems sometimes withdrew service when need was greatest, exerting a further "revictimization . . . punishing effect" (child advocate).

Meso-System Barriers

M's disease gives her a lack of "resilient immunity" to stay healthy, and she requires constant guarding against bacteria and viruses and vigilance in her micro-environment. Teachers and her parent felt that she would benefit from a cognitive specialist and support for home learning and that her classroom would benefit from an aide. It has been difficult for the principal to find the funds because needs in the school are difficult to prioritize. M did not meet the learning-sector funding criteria for "special needs." At the time of the interview with the principal, M had been away from school

again, and the principal had not yet received a certificate from the physician, which he had requested through M's mother, in order to put home schooling in place if necessary. A team process to interrelate M's micro environments is not in place. There is a lack of communication at times among the caregivers, and a coordinated plan is not in place for M. The "handoff" (government representative) between roles lacks clarity, and the caregivers appeared unsure as to who should take the lead and when to initiate process to help M.

The elements of lack of time, resources, staff, and knowledge and of apprehension and fear were described. The principal was becoming familiar with the new ESHIP services that had the possibility to enable a team approach with M. The primary care physician, teachers, and parent were not yet fully aware of ESHIP services, and the "ground-level" caregivers for M had not yet been able to synchronize efforts. The experiences of M and her caregivers had, at times, mirrored barriers described by the child advocate for all children. There is underfunding and a lack of a coordinating process and interrelating structures. "Revictimization by the system" (child advocate) could be seen in the increased stress on M's mother from her search for resources and constant relaying of information, and in missed opportunities of programming that M endured because, for example, the bus ride was too long for her to manage to reach the program site. M's parents had experienced a lack of "receptiveness" (child advocate) early in M's illness.

The participants described similar barriers that are evident for many children in the community. Many are institutional factors, including cultural contexts. Additional elements are lack of knowledge, interdisciplinary learning opportunities, team structures, formal systematic linkage processes, and advocacy; and easy access to a single area of knowledge about services, supports, and childhood. All detailed the hazardous effects that occur with a lack of consistency of relationships. A focus on disease only rather than capacity and health is a frequent barrier. All described the frequent inability of linkage to get to the child and family level from the large system infrastructure in its current arrangement. "System gridlock" (child advocate) resulted in many children being given an inappropriate solution that was available, rather than one that solved the problem properly. Knowledge sharing was often limited, lacking interdisciplinary linkage being

and "too theoretical" (physician B). The child advocate described many "competing interests," especially evident at times when guardianship for a child had been assumed by the province. The overall descriptions detailed a lack of efficient linkage infrastructure in the community

Exo-System Barriers

All participants expressed a lack of awareness of linkage practices, as well as the regional, provincial, and federal linkages for services and supports. An integrated accessible "picture" of services and supports for childhood in Alberta does not exist. The lines of responsibility for the areas that affect learning in the child are still blurred, according to parent, principal, teachers, child advocate, and government representative. Service system teams are beginning to access schools through the Edmonton Student Health Initiative in Region 10, but not in other regions. Knowledge about linkage practice involving integrated services and community participation, and how to bring these into the institutional fabric of the school, as opposed to remaining at the institutional boundary, is just beginning to develop. The linkage planning and practices involving several major provincial funding initiatives that affect schools (SHIP and AISI) are generally not coordinated at the school level. The child advocate stated that the SHIP partnerships, at this point, could take any form and may need more definition for their practice to attain goals meaningfully. Areas of ongoing development, as described by the government representative, are the continued development of strategic planning with policy and guidelines toward more integrated practice. The government representative noted that there is no research in Alberta on how the institutional environment in schools affects the developing child.

Participants agreed that the systems are lacking in coordination and integration. The ability for early need identification and intervention is not at an optimal level for many areas of need in childhood. Parent, principal, teachers, physician B, child advocate, and government representative described insufficient development of the ability to facilitate communication and interrelationships among community groups to support children, families, and each other. Some community power structures, the difficulty in sharing power, and a significant lack of funding for the systems that care for children are major barriers described by all. The child advocate stated that there are no standards for

many core services and often a general lack of political courage. Many descriptions by the participants show that institutions do not currently have enough integrated linked infrastructure to increase the ease of access to knowledge at the family level. The parent, teachers, principal, physician B, and child advocate felt that there is often too much reliance on parents to support the child on their own without the needed resources, professional support, and time. Parents are often not given significant opportunities to bring needs forward on a collective basis to help with planning and implementing practice and broadening the community's ability to advocate. The resulting stressful interactions or aggressiveness increase linkage barriers.

The state of knowledge-sharing about childhood was not seen as broad or "practical" enough by all participants. Physician B stated that knowledge dissemination about childhood is weak, lacks a "forum," and often does not reach family and practitioner levels. Most felt that there is an insufficient emphasis on interdisciplinary learning. The child advocate found a great lack of understanding in communities about child, family, and community rights to contribute to decision-making. Physician A underlined the importance of societal discussion regarding the complexity of roles and responsibilities concerning the rights for children, families, and communities.

Macro-System Barriers

All participants acknowledged that coping with a strong, assertive, or aggressive parental voice could be intimidating or annoying and that it requires understanding and sometimes more effort. The professionals, child advocate, and parent described the barriers to interaction when parental perspective is not acknowledged and validated. The parent, principal, and child advocate described the general lack of knowledge for parents and professionals about how to advocate well. There was agreement by most that communities often have a lack of knowledge about how health and learning are linked concepts. Many more parents are working and have less time to spend in the school environment. The difficulty many communities have in surmounting the barriers for vulnerable children was emphasized. Some children's needs are invisible, hidden from view by parents, not recognized by family or professionals, or hidden through confidentiality of information. The parent, professionals, and government representative,

child advocate doubted that they could always protect the child well at the individual micro-system level.

There is a significant lack of clarity about the "special-needs" designation in Alberta, difficulties maintaining support during periods of transition for the child or youth, and systemic and societal barriers to sustaining support to youth over a longer period of adolescence that may be experienced.

The parent and the child advocate saw many needs that require more resources and felt that there is little evidence that communities are committing to the implementation and action that children's needs would dictate. Time in professional and personal lives is stretched thinly. More societal discussion in areas affecting childhood, such as our societal emphasis on work and productivity, lack of emphasis on children and parenting, societal power structures including cultural structures, and the effects of regionalization of services is critically needed. Structures and processes are not fully in place to carry out the government's and society's responsibilities for children, youth, and families. No research in Alberta is being done in the area of best practice as to how to create "child-friendly schools," according to the government representative. There are too many needs, too few resources, a lack of best practices to be developed and shared, and much work remaining to be carried out by the Alberta Children's Initiative.

It was agreed that there remains a macro-level lack of recognition that our wellness is tied to each other as well as to other system elements such as air, food, and water (parent). All described an exacerbation of effect when problems are not easily identified and worked on proactively. There are many untapped community resources and a lack of cohesiveness in some areas. Participant descriptions indicated the broad areas where linked support should be put into place, but there were fewer recommendations as to how to specifically put linked structure and process in place that could span the micro- to macro-levels.

Ecosystem Linkage Facilitators

Linkage facilitators were elements within the ecosystem that encouraged the formation of linkage structures, processes and outcomes

Micro-System Facilitators

M described the importance of a sense of trust and a genuine approach that signal to her that her family and caregivers really want to support her as best they can and have the ability to do it. All participants described the need for openness in communication, a "receptivity" (child advocate) that improves the quality of the interrelationship and the efficient meeting of needs for all children. The new multisector Student Health Initiative Partnerships were described as beginning to address certain individual student needs at the micro-level. Anyone could refer a student through a single point of entry to this funding source. The Child Advocate Program also works in the microenvironments of children under government care in the child welfare system and accepts referrals from all concerned. There was agreement on the importance of the sustainability of relationships and other resources and a focus on learning, abilities, and overall health. The recognition of rights and the ability to respond to a diversity of contexts in the micro environments are important.

Meso-System Facilitators

M stated that she needs those caring for her, including her peers, to be observant and vigilant about her cues and needs. She described the need for attunement to her needs for her survival and for her ability to develop her own abilities to participate in the wider institutions of the family, school, and community. She described her need for humour and hugs. Physician A stressed the importance of focusing on "fitting the disease into healthy living, . . . minimizing the impact of the illness." M's parent described her own need for "full knowledge." M's family places a high value on interrelationships, which are necessary to accommodate the disease to healthy living. All caregivers saw M's mother's assertiveness as an asset and a protective factor for M even if it made their relationships more challenging and difficult at times. All participants were striving for these goals through linkage, but expressed frustration with the lack of knowledge and resources. M's parent stated that she needs a nurse coordinator from the secondary level ambulatory care area from the time of diagnosis, as do all more complex children upon diagnosis, to help with accessing support, education, and communication of information. M needs a cognitive specialist and learning help for home and classroom, according to parent,

teachers, and principal. A coordinated plan to which all caregivers and M contributed is needed for M to facilitate relationships and sustainability of linked support.

Most facilitators described by all participant for M and for all children, had the goal of transferring support directly to the micro environments of the child and family. There was agreement that communication, policy, and structure need to be more comprehensive to cover the span of transitioning environments in children's lives. All, including M, described the need for opportunities for children to participate in strengthening themselves and others. In doing so they, in turn, strengthen their micro environments, such as the family, classroom, or peer grouping. The facilitation of supportive networks for the child, family, institutions such as the school, and community was seen by all as necessary to increase the healthy functioning of all levels of the ecosystem. Increased knowledge and help with developing community partnerships, including services and advocacy around schools, was seen as essential to create synergy among resources. There was consensus that a critical facilitator, not yet in place, could develop to become an easily accessible knowledge source about childhood that presents a clear picture of services, supports, and information available to all in the community.

Exo-System Facilitators

More communication, knowledge sharing, and processes that interrelate community areas are critical linkage facilitators that are needed, according to all participants. More positions and structures to coordinate linkage at the child, family, and school level were seen as necessary by all. Increased linkage structure and process, including other disciplines and community areas, around schools, early childhood areas, and health institutions were described as needed to facilitate positive outcomes. Linkage facilitators to increase parental advocacy were considered important by all. School linkage could include more linkage with the Child Advocate Program, according to the child advocate. The development of an integrated source of knowledge about childhood including the services and supports for communities was identified as a much-needed facilitator.

Addressing the vulnerability in each system level was an important focus that was emphasized. Easy service access and access to other disciplines, community areas, and knowledge about support were considered by all to be a linkage facilitator that requires

much more development. Linkage that facilitates the educational opportunities to learn about working and participating in integrated and coordinated environments, to learn about respect for other perspectives, and to develop collaboration and consensus skills were described as much-needed facilitators. Policy, structure, and practice that foster system interrelationships and partnerships (e.g., SHIP, AISI), integrated teams, collocation, linkages between institutions and a strong coordinating body for children and youth in provincial government, and funding strategies with flexibility that direct help to the whole child were considered important exo-level linkage facilitators. All agreed that more funding and other practice strategies are needed to provide depth of care to children, youth, and families beyond assessment only, including concrete action toward promotion and prevention. Improving support through the classroom environment, bringing interdisciplinary and community knowledge to schools, has the potential to be a major facilitator of linkage.

According to teacher A, the time was right for action plans in all sectors for linked support to children. The government representative stated that a plan with government partners is being worked on in the early childhood area. The formation of guidelines for interdisciplinary and community practice that will promote "wrap-around support" for families was considered as potentially very helpful by most participants. Standards for core services and integrated practice were a greatly needed facilitator, according to the child advocate. The child advocate and the principal stated that the use of broader structures that have joint planning and accountability and a service orientation are effective large-scale facilitators.

Linkage structure and process that encourage healthy living and minimize the impact of illness (physician A) was described by other participants as essential. Structure that promotes greater understanding about Aboriginal culture and potential linking processes to protect the healthy development of these children, families, and communities is an important facilitator described by the child advocate, physician A, and government representative. All acknowledged the importance of the linkage of community areas to areas of knowledge about childhood and to knowledge about the contributions of other community areas. Promotion of a culture of ongoing evaluation and sharing of

knowledge about best practices is a critical facilitator described by the child advocate, government representative, parent, principal, and physician B.

Macro-System Facilitators

The participants detailed a number of important macro facilitators. Cohesive coordinating structures in sectors and society are much needed facilitators to work alongside societal changes and changes to governing structures such as site-based management of schools and the regionalization of services. All participants saw the need for developing increased awareness of the importance of linked support and of where and how it should occur for maximum effect. More communication that acknowledges and validates need and promotes trusting interrelationships is an essential ingredient of macro-level linkage. The use of skilful linking around institutions such as early childhood areas, schools, child health areas, and neighbourhood family centres for support and education was advocated. Another focus of linkage was to develop parental skills through curriculum and to help parents connect to knowledge and each other right from the birth of the child. The government representative cited the need for more research in Alberta to describe successful school communities. Physician A stated that more research on the relationship between social functioning and severity of disease is needed to understand the full effect of linkage across the ecosystem.

According to all participants, working together "with a focus on healthy living" (physician A) reduces stress in all levels of the ecosystem. A focus on linked support to achieve community effort to cope with vulnerability in children and families is an important goal. This requires the purposeful development of the ability to adjust to varying family situations and to the movement across the child's micro-environments. Working closely on federal and provincial linkage was considered essential on many more specialized initiatives and in the area of support for Aboriginal children and communities. Alberta is working on a plan for its children and is developing information on the state of Alberta's children. The further development of interdisciplinary and community knowledge about linkage practice was seen as crucial. Developing greater understanding about healthy childhood in order to value both childhood and working together to achieve this goal are ongoing macro-system facilitators of linkage that were advocated by all participants.

Eco-Subsystem Sector Analysis Using Documents

The document templates with their appended syntheses were sorted into eco-subsystem levels and then reanalyzed and presented here by sector (the learning sector, health sector, and children's services sector). Attention has been given to public participation and inter-sectoral initiatives within the eco-subsystem levels. These analyses are presented as well. Ecosystem document analysis was carried out in the following sections: regional documents, including business plans from the regional learning, health, and children's services sectors; regional documents for public participation and for inter-sectoral initiatives; provincial documents for the business plans of the learning, health, and children's services sectors; provincial documents for policy and planning in the learning, health, and children's services sectors; provincial documents for public participation and for inter-sectoral initiatives; and federal-level planning and research documents. Analysis was undertaken for M's case and for all children.

Meso-System Documents

Meso-system documents used for this section were those from M's school, the school council, the area health council, and the Regional Child Health Centre.

Learning Sector

M's school's three-year education plan proactively prepared the context for developing community partnership, including corporate participation. The public education system no longer fully funded the many needs in a school. Fundraising by parents has increased to try to support the public system. Community connections in the document were described with a promotional public relations approach rather than a more integrated approach among community areas. Interest in developing the school as a social as well as an educational institution was evident. Partnering with other schools through the teachers is a positive linkage initiative already in place. The school's educational goals are broad, including character education, preparation for work, and citizenship. M's school was a pilot school for the Safe and Caring School program. The overall health and wellness of the students was not addressed other than in the context of "safety." The measures proposed are behaviour focused.

For all students, the Edmonton Student Health Initiative Partnership (ESHIP), a linkage initiative for bringing an interdisciplinary service team to the school, was

beginning. A full plan and resources to develop a healthy school community with involvement of other disciplines and other community processes were not yet operational. Teachers remained stressed and alone as the front-line resource to meet student needs.

Health Sector

M receives care from the Regional Child Health Centre. Its hospital policy and procedures for tertiary level and ambulatory secondary level care do not have policy regarding linked support between the institution and other community institutions and environments. A larger scale of linkage structure and collaborative process are essential to bring needs forward, act on them, and make greater use of community resources. Integrated professional practice is targeted in such new developments as ESHIP. However, institutional policy, guidelines, and practice need further development to support linkage infrastructure frameworks.

A greater effort within the meso subsystem is required for M and for all children to understand and implement effective, efficient linkage infrastructure for the individual, classroom, school community, public participation, and policy levels. A broad ability to track and support the movement of the child through micro environments to promote wellness beyond the minimum requirements of "protection" and "safety" toward a focus on "healthy living" (physician A) is required.

Public Participation

M's school council is active but has done limited work in the area of community partnerships and advocacy for student needs. According to the principal, fundraising is the largest area of parental involvement. Simultaneously, parent volunteering has been decreasing in M's school, and the school council bylaws do not specify the formation of committees to encourage the processes of community partnership.

The Community Health Council in M's region has been using wider consultation processes with a focus on Capital Health's priority areas. The Community Health Council initiated a process with schools in M's area when they conducted a survey that included the area's schools, but principals had been the only responders, not their school councils. Regular process between the school council and health council was not occurring.

The formation of school councils and health councils in the last six years as vehicles of public participation has increased the extent of public participation, advocacy,

and direct community links to school boards and health authorities. There remains a lack of knowledge, time, and resources by the public and service systems as to how to use them to their potential.

Exo-System Documents

Exo-system documents include regional, provincial, and federal level documents that have not directly involved M's family but have influence on her case, and for all children. Exo-system documents included those for the learning, health, and children's services sectors; the justice business plan; and inter-sectoral initiatives and documents about public participation. This section is divided into regional planning documents including business plans, provincial planning documents, and provincial business plans.

Exo-System Regional Planning Documents

Learning sector. In light of recent provincial initiatives for children, the Edmonton Public School Board (EPSB) needs policy that supports the use of integrated consultation and practices, supported students, school communities, and early childhood areas. General policy from the Edmonton Public School Board lacks clarity and specific encouragement for integrated practice and public participation in schools. EPSB is committed to developing community partnerships, including those across sectors, for the school system. The policy goal is to link community partners to build healthy school communities that promote both pedagogy and healthy development. The school's institutional roles are implied but not sufficiently detailed in present policy. Policy and practice to provide effective support during student transition points, including expulsion, are not sufficiently comprehensive. There are no guidelines on the development of school community linkages to help schools develop effective community practice. Policy implementing regular systematic linkage process between elected school trustees and legislated school councils is not in place.

More intra-sectoral vertical linkage and inter-sectoral horizontal linkage in the EPSB *Three-Year Education Plan* encourage the implementation of linkage practice. Increasing school health is a goal. Encouraging community partnerships, more responsive programming for Aboriginal students, and student knowledge of global interdependency are also goals.

Participation in the Edmonton Student Health Initiative Partnership (ESHIP) has increased the systems' ability to address student needs at the individual level. The needs for service are far greater than resources available. Process to encourage more parent involvement has been developing; for example, website development. School councils usually are not linked to each other or to other councils in different sectors. Therefore, the larger community view and advocacy are deficient. EPSB linkage to the Community-University Partnership for Study of Children, Youth, and Families is in place to facilitate linkage of knowledge, best practices, and applied research ability.

Health sector. Capital Health has many linkage goals. The health/learning linkage is improving, as evidenced by workload sharing at the institutional level. Child health ambulatory care areas require much greater community linkage. Planning has begun for this goal. Increasing public self-rated knowledge of the system is a regional linkage goal for the health sector, and M's parent also indicated that the availability of public knowledge about childhood is a significant gap. Multisite information systems are developing.

The link between health and learning in childhood is not a priority in the Capital Health business plan. The current public health targets in the Health Authority Business Plan do not focus on children's healthy development other than narrow targets of low birth weight, infant mortality, and smoking. As a result there is a significant gap in the measurement of healthy child development and its accountability within the current business plan. It is not a regional priority. Health councils are initiating linkage to communities but do not regularly link with public councils in learning and children's services sectors.

Children's services sector. In service planning documents the Region 10 (including Edmonton) Children's Services Authority advocated a community development coordinator to promote knowledge sharing, service inventory, and connect to the Community Advisory Committees (CAC). Neighbourhood Centres for Child and Family Services will become hubs for children's services access. Co-location of some service areas with health and learning sites has begun. A goal for vertical, intra-sectoral integration is closer linkage with early childhood areas, permanency planning, and services for disabilities. Region 10 Children's Services Authority will have a number of

advisory structures in place, including a community advisory council, a youth council, and one with associations. There are no standards for children in Child Welfare regarding transition procedures between provinces to ensure that the rights of the child are preserved. When an aboriginal community was given responsibility by the government for Child Welfare services, accountability through standards was not carried out, resulting in insufficient protection for these children. The Child Welfare Act was the only Act in Alberta's legislation that included the overriding best interests of the child provision, to comply with the United Nations Convention on the Rights of the child (Pellat, 2000). Yet the goal of best interests of the child was central to the provincial government agenda for children. None of the statutes in Alberta Legislation directed that programs be administered and resources allocated in the best interests of children. Consideration of the views of the child was not fully respected in Child and Family Services Act as children receiving services outside of Child Welfare did not have an advocacy and complaint process through the Act (Pellat, 2000).

Inter-sectoral initiatives. The Student Health Initiative Partnership (SHIP) is a $26-million-dollar provincial initiative. Within SHIP, the regional partnership Edmonton Student Health Initiative (ESHIP) had structured cross-sectoral teams that bring speech and language services, occupational health services, nursing services, and emotional and behavioural services to students at schools. These teams could liaise with other community teams such as those from children's services, other institutions, the neurodevelopmental clinics, mental health areas, and others. Linkages have been developed in the region that include the city and several surrounding rural communities. The lack of co-terminus boundaries between the school boards, the children's services authority, and the health authority have necessitated nine partnership processes for the health authority. This has increased institutional and community time, resources, and coordination. A single point of entry for Region 10 was put into place, and co-location of some service teams by geographic region is occurring. Anyone can refer a child to ESHIP, including parents. Because principals have so far retained the "gate-keeping" role, how service teams will be brought into the institutional fabric of the school remains very dependent on individual principals. This as an area of practice has not been researched.

The regional ESHIP steering group is multisectoral, with long waiting lists for services. Many gaps have been acknowledged as the initiative grows, and resources are not available to meet the demand. A significant gap in the ESHIP service plan is that there is no co-ordinated, broad-based, human-services plan for student health supports at the provincial or local level. ESHIP is making a contribution toward the development of healthy school communities in the region. It is a self-described "catalyst" for a more coordinated approach to delivering school and community-based support services for children and has become a structural catalyst to add leverage to linkage.

Many parents are not aware of the possibilities of the SHIP initiative. There is now a parent advisory group in place for ESHIP (Region 10, Author, 2001). There has been evidence in Region 10 that planning for health, education, and children's services to develop greater ability for a "wrap-around" service for families is advancing. To make this a reality for children and to provide support during times of transition, clarity of roles and handoff between teams needs more development to assure constancy of support. For example, the children's mental health area has been developing new service plans, and the children's services area is providing emotional and behavioural services for groups through ESHIP. Practice promoting permeability among the team linkage structures will need ongoing knowledge development. Undergraduate education in the human services requires more emphasis about linkage practice and public participation. Without such linkage structures and processes, much is left to chance. The sustainability of linkage for child, family, and community is at risk.

Support to the other important institution, the family, was also brought to the region and several other regions in the province through the Healthy Family Initiative for very young children and their families. This project has increased community abilities and developed interdisciplinary synergy. In a rural initiative it has embedded community health nurses in the service initiative. Healthy Families in the region uses new joint-funding strategies that create accountability of the partnership and enable greater dissemination of findings and practice through the partnership structure. More involvement with Ma'Mowe has been identified as needed. The initiative requires greater access from early childhood areas, child health clinics, and other institutions to increase community linkages and support. Ongoing funding and availability of the program to

other provincial regions is a great need to achieve larger-scale meso- and exo-level linkage for children's healthy development.

Participants acknowledged that many community resources are untapped at present, and standards for integrated practice across the sectors are not yet in place. Standards would become facilitators of linkage to protect the student, family, and community rights and responsibilities.

The recent Child Health Program plan has been proposed but not yet funded. The Pediatric Ambulatory Clinic Functional Program describes the linkage goal of the child health clinic ambulatory areas as developing into accessible community service "nodes" with strong linkage to other sectors. Child Health Clinic nodes would have parental participation as part of the administration process and service delivery, increasing both professional and community linkage abilities. With such development these service hubs would become a base for more extensive education of medical students and students of other disciplines, children, parents, and communities. A similar kind of development has been initiated in the Neighbourhood Centres for Children, Youth, and Families, which are service hubs for the children's services sector. With ESHIP, regional schools are starting to develop as areas of increased service access. These cross-sectoral community institutions have goals to increase community and institutional linkage abilities.

Public participation. Currently, cross-sectoral, systematic linkage process between inter-sectoral public advisory councils is not sustained. M's Community Health Council has held a community consultation process using a survey of school priorities. This cross-sectoral initiative is a project to begin a partnership with parents, school councils, and the community health council to share knowledge, responsibility, and advocacy. However, the school surveys were completed by the principal, not the school council. This gave bureaucratic input but not public input. The survey results indicated that strategies to increase public knowledge of services and supports are greatly needed and a longstanding gap. The health council discussion of the survey centred on the more traditional, more disorder-oriented "health issues" that Capital Health identified as priorities. Discussion about the importance of broader, proactive linkage goals such as healthy school communities may become possible if an ongoing inter-sectoral linkage process occurs among public councils.

Public participation linkage structures are developing through community health councils, school councils, and community advisory committees for children's services authorities. Community advisory committees for Region 10, Ma'Mowe, will be linked to the Region 10 Child and Family Services Authority Board through a Regional Advisory Council (RAC). The six Region 10 health councils are linked directly to the Capital Health Authority Board. Community health councils have a liaison committee that links the health authority board to the councils. A similar linking structure is not in place for EPSB, though councils of school councils (COSC) are beginning to form in some areas of the province. School councils enable one type of public participation for the site-based management of schools. School councils are advisory to the school principal, and each report to its school board. They have a link to regional in-servicing through regional education consortiums in the learning sector. School councils are not linked well to each other or to public councils in other sectors, preventing deeper community understanding and advocacy for childhood from all sectors.

The three regional sectors of health, education, and children's services have linkage structures for public participation that are advisory rather than just consultatory. These participatory structures now require proactive processes and knowledge to develop expertise in linkage practice to strengthen public deliberation and social union for childhood.

Exo-System Provincial Planning Documents

Learning. The Alberta Initiative for School Improvement (AISI) planning includes the education stakeholder groups and representation from the university. Input from other sectors is not visible in the planning, though the practice of school improvement requires linkage to other sectors to develop effective cross-sectoral approaches. A stronger linkage between AISI and SHIP is needed to share knowledge about community practices developing in AISI and SHIP that are effective at the child, family, and community levels. Lack of advisory school council linkages affects the development of public knowledge and community effort in these initiatives. There is more emphasis in the planning documents here and by all government sectors on the importance of professional development and on knowledge sharing with the public.

Health. The Children's Mental Health initiative was aimed at many unmet needs at the micro-, exo-, meso-, and macro-levels of care. The Provincial Mental Health Board has a provincial rather than a regional mandate and needs closer linkages with the regional practices evolving around the other government initiatives for children, for clarity of roles and responsibilities among regional structures. It is developing a single point of service entry. It highlights the difficulties with need identification, including difficulties in Aboriginal communities, where cultural factors could be barriers.

The Aboriginal Mental Health forum identified an important need to clarify roles and responsibilities between ministries and promote the development of province-wide integrated policies for children. It has recommended more integration of Aboriginal mental health areas into the Alberta Learning curriculum for all students. Increased knowledge within government departments about other initiatives has been identified as a significant need. Provincial government initiatives emphasize the importance of working toward early identification of needs. It is evident that many more collaborative linkage structures are needed to carry out this goal for childhood.

Children's services. It is a notable gap that the Provincial Accountability Framework for Child and Family Services does not include the Health Acts in its key pieces of legislation for the formation of the child and family services authorities, because children's authorities would directly affect the healthy development of children and youth. The framework does not include the provincial Public Health Act or the Canada Health Act, leaving room for a legislative and policy barrier.

Inter-sectoral initiatives. The Child and Family Services Authorities Act (CFSA) states that there must be partnering ministries, community participation, and informing of communities; and that standards for practice must be developed. With this precedent, regional community care plans should be in place. Families can become informed of services and supports available. Such a commitment to integrated, long-range community action plans for childhood remains to be developed with the health and learning sectors. One successful linkage is the Alberta Partnership on Fetal Alcohol Syndrome, which imbeds knowledge in this area into the Alberta Learning health and life skills curriculum. There appears to be a lack of evidence in the health sector that shows recognition of its

role and accountabilities in the primary and secondary continuum care levels of inter-sectoral support for children, families, and communities.

The ongoing sustainability of healthy school communities in the province remains at risk without the development of further linkage ability. Parents at all schools need more knowledge of major initiatives for childhood. Without sufficient resources, including human resources, the catalyst effect of SHIP will not materialize. To achieve the goal of healthy school communities requires continued resourcing of the SHIP as well as other provincial and community initiatives contributing to the school and early childhood environments, increased access to interdisciplinary services, service teams including physicians and nurses within the school, and increased boundary permeability of interdisciplinary service teams into the school's institutional structures. It would require further funding and provincial coordination to develop a large-scale coordinated, inter-sectoral, preventive-promotive focus for school and early childhood environments. It requires greater knowledge development and sharing of the impacts of the health/learning link on the child, family, and community and of the institutional and community processes needed to bring about optimal outcomes in the child, family, and community.

The Review of the Office of the Children's Advocate recommended the development of guidelines for Individual Program Plan development for students, and increased program delivery and parental involvement. It recommended that the Office of the Children's Advocate report to the legislature rather than the Children's Services Minister.

Alternate funding strategies and joint accountabilities that improve partnership process and accountability are evident in the Regional Healthy Families Initiative and in SHIP. Skill is developing with information systems, including increased gathering, protection, and sharing of information. The amendment of the Freedom of Information Protection (FOIP) legislation has increased inter-sectoral flexibility for information disclosure when it is considered necessary for integrated service.

Public participation. Parental representation has been included in AISI (Alberta Learning, 2000) and in the province of Alberta's (2000) Review of Special Education. The review highlighted a lack of accountability mechanisms in the areas of parental

involvement in decision-making. The review of the Office of the Children's Advocate (Alberta, 2000) used extensive community consultation and identified a significantly increased need for community systems advocacy for children. Other major factors identified were the need to decrease institutional factors such as school rigidity and to increase cross-sectoral advocacy abilities.

Provincial Business Plans

Learning sector. Alberta Learning has advocated the development of an evaluative framework for the Alberta Children's Initiative with partnering ministries and the development of collaborative models with stakeholders for joint initiatives. An important specific goal of the Learning plan was a stronger link between the Learning's business plans and a human resource plan.

Health sector. The Alberta Health business plan has had a major emphasis on the tertiary level of care and narrow measurements for accountability in children's community care, especially at the primary and secondary levels. The information technologies in the Telehealth initiative and the Alberta Wellnet are developing the sector's ability to share knowledge.

Children's Services sector. The Ministry of Children's Services business plan has a systems perspective that recognizes the interdependency of children, families, and communities. It supports the promotion of community advocacy for children. However, the emphasis on increasing the skill and abilities of the system to develop integrated community practices with other sectors has little emphasis in this plan. Provincial inter-sectoral planning, evaluating, and rewarding for coordinated effort are not areas of emphasis.

Alberta Justice. Alberta Justice is developing a multisectoral communication plan with its partners. It supports early intervention and work with Children's Services.

Inter-Sectoral Summary of the Provincial Business Plans

The provincial business plans evidence a context being formed for more integrated planning and practice, but full institutional support is not in place or resourced to achieve expertise. All of the Province of Alberta business plans support the goal of public advocacy. The critical need for a "Community Care Plan" was noted by the Children at Risk Task Force (2000). More funds for applied research, such as the

endowment fund proposed by the Report of the Task Force on Children at Risk, illustrate the community need for knowledge development at a practice level. The Learning business plan emphasizes the importance of developing research capacity in the Learning sector. However, it emphasizes science and economic research development, not partnership with other sectors such as Health that share responsibility for children's healthy development. Identifying best practices is a priority in the Children's Services Business Plan. To achieve this linkage goal in ways that reflect children's need for integrated expertise, all provincial government sector business plans need to contribute resources to develop joint, inter-sectoral, integrative research abilities in all sectors with responsibility for children, youth, and families.

Macro-System Documents

These documents described several large-scale federal and provincial documents, reports and research.

Health Sector

In Alberta, knowledge about strategies, tools, and accountability are developing in the area of linkage for primary care. In the Advancing Primary Healthcare in Alberta report, HowardResearch (2000) stated the need for collaborative practice models and sustainability tools. Evidence shows an inability to share administrative information between the region and the primary care projects.

The Federal Health Minister's Advisory Committee on Investing in Early Child Development declared a need to develop further strategies for planning. According to the advisory committee, the health sector is an important primary public contact point for families who should have further development. The learning sector has become more involved as children mature. A standard set of indicators to measure the impacts of policies and programs has been proposed, and the committee has recommended that measurement be carried out through the National Children's Agenda. The linked concept of health/learning in early childhood was not emphasized by the Advisory Committee. Such linkage would require provincial sector cooperation in early childhood service delivery. The advisory committee acknowledged in its document that natural environments and human-made environments affect children. This comment depicts the macro-level barrier of removing human activity from its natural context.

In the document, provision of environmental health does not include the provision of relationships and supportive environments that are key for the creation of living experiences for healthy development of the child, family, and community. These critical gaps need to be filled at macro-level discussions by ministers to develop more cross-sectoral ability to implement linkage goals from the broad-based community context.

Inter-Sectoral Initiatives

The importance of sustainability, of provincial frameworks, and of service-site linkage, including corresponding support to parents, with access from children's micro environments, was recognized in the study documents. There was increasing emphasis on private-public linkage.

In *The Early Years Study*, Mustard and McCain (1999) emphasized the linkage goals of cabinet level, though a mandated government model was not considered desirable. Overcoming the "legislative, policy and administrative divide between different services in early childhood development" (p. 118) is required. For instance, education is a provincial jurisdiction, but early childhood kindergarten services are under the Education Act, and Child Care is not. Integrated legislation for programs, including standards and funding mechanisms, is critical. *The Early Years Study* (Mustard & McCain, 1999) also described the importance of a societal "locus of responsibility" (p. 120) for knowledge development and sharing. In Region 10, the Community-University Partnership for Study of Children, Youth, and Families, is an open linkage structure to develop and share knowledge in the areas of research, education, and practice at all levels in the ecosystem of children.

APPENDIX D

EXAMPLES OF LEVERAGED LINKERS FROM PARTICIPANTS AND DOCUMENTS

Examples of Leveraged Linkers from Participants and Documents

Knowledge networks for information and services:

Community-University Partnership for Study of Children Youth and Families (CUP)
Alberta Children's Forum
joint research projects e.g. one example of Alberta being linked with national activities is their connection with Health Canada and Canadian Centre on Substance Abuse research project to identify best practices for Fetal Alcohol Syndrome.
Capital Health's school health resources website
Capital health services LINK: a 24 hour integrated telephone and web based service
Telehealth
Alberta Wellnet
Ma'Mowe's (Region 10) future development of a database of key community constituents to be kept informed of the work of the authority (principals, advocacy groups, churches, cultural assoc., etc)
A resource list of expert service providers recommended by the Aboriginal children's mental health forum.
A panel of experts will act as a forum for review of issues, ethics or materials developed by the FAS/E initiative.

Potential macro-system leveraged linkers:

National Children's Agenda to build a national strategy across jurisdictions
adoption of a standard set of indicators was considered important for short and long term impacts of programs and policies

Exo-system leveraged linkers:

Alberta Children's Initiative
Youth Secretariat, a mechanism in the Alberta Children's Ministry
Child and Family Services Authorities , School Boards, Health Authorities
Healthy Families Program
Provincial mental health design committee
Aboriginal children's mental health forum recommended a stakeholder group to develop a model for aboriginal children's mental health.
Use of the Health and Life Skills curriculum to teach about fetal alcohol syndrome; the development of a teacher resource; a strategy to put the information into post secondary education programs for service providers was being developed.
Clinical Practice Guidelines for FAS/E were being implemented through Continuing Medical Education.
At Risk Task Force proposed shared protocols with school boards, children's authorities, family and social service agencies for follow up services to youth who are expelled or drop out of school.
Private sector partnerships

"Community service plan" as recommended in the Task Force for At Risk Children
Ma'Mowe Children's Services Authority strategic planning: four regional planning and linkages groups will be established with partnering ministries (Health, Learning, Justice), municipal service providers (Community Services, Police) and provincial service providers.
Linkage between the Ma'Mowe Children's Services Authority and local and provincial associations for service providers or stakeholders will be established for communication of issues.
Aboriginal Wisdom Committee
Interdisciplinary courses and educational opportunities.
Alberta Learning Special Needs Review called for accountability frameworks, Outcome based funding (as opposed to administrative monitoring), protocols and guidelines for practice and services, best practice models on transition planning
Potential development of standards for integrated and coordinated service and practice

Meso-System Leveraged Linkers:

Grade level teacher network with neighbouring schools at M's school to share strategies and best practices.
Potential development of service hubs through schools, Neighborhood Child and Family Centers, Child Health ambulatory areas
Proposed Early Childhood Development and Parenting Centers
Edmonton School Health Initiative Partnership service plan (ESHIP) Vision "is the catalyst for creating a coordinated approach to delivery of school and community based health and support services for children" (p. 7).
Single point of service entry for ESHIP
Single point of entry as access to services and support, as recommended in the Task Force on Children as Risk
Service teams in ESHIP; Ma'Mowe service teams
Business and community partnering at schools or early childhood areas
Shared leadership model at M's school
Individual Program Plan for students
Integrated curriculum: school processes impacting learning and curriculum (e.g. Health and Physical Education Curriculum, HPEC)
Kids Crime stopper program brings engagement to students themselves

Leveraged Linkers for Public Advocacy

Ma'Mowe's (Region 10) Community Advisory Committees linked to the ten Neighbourhood Centres for Children, Youth and Families
Capital Health Authority Community Health Council Liaison Committee
Professional and parental associations
Partners in Learning Manual (Alberta Learning)
Councils of school councils